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RECENT ADVANCES IN THE MEDICAL TREATMENT OF PERIPHERAL VASCULAR DISEASES

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Essential hypertension is a serious disease in the United States, accounting for perhaps twice as many deaths as cancer.[1] This condition has been entirely too much neglected by the medical profession for several reasons, which follow:

1. There is a belief that elevation of the blood pressure is a symptom and not a disease. What difference does it make, however, whether hypertension is a symptom or a disease, since it kills people who would survive if they did not have hypertension? Failure to treat hypertension because "it is a symptom and not a disease" is entirely illogical and represents an attitude of mind which should be strongly condemned. There is need for reduction of blood pressure in essential hypertension.

2. There is a common belief that elevation of the blood pressure in essential hypertension is necessary for normal function of the body, particularly of the kidneys, and that reduction of blood pressure might seriously impair normal activity. There is no support for this belief. Our studies at the Mayo Clinic, and those of others, indicate that blood pressure may be reduced by sympathectomy with the result that cardiac and renal function are improved or, at least that they are not impaired. Almost uniformly, patients having hypertension feel better when their blood pressure is reduced by operation than they felt before its reduction. Headache, dizziness, pain in the thorax and nervousness are benefited in a routine way when the blood pressure is reduced. Dyspnea and fatigue with exertion may occur after operation but tend to disappear as the time after operation increases. None is disabled.

3. There is an attitude of hopelessness concerning the treatment of essential hypertension. Many physicians have tried remedy after remedy highly recommended in advertisements and by detail men but have failed to demonstrate any beneficial effects of these preparations on blood pressure. Pessimism is justified in many instances but the situation does not appear to be hopeless.

The mechanism by which blood pressure is elevated is well known. The arterioles offer increased resistance to the flow of blood through them. In the earlier phase of most instances of essential hypertension, this increased resistance is functional and reversible as is shown by the observation that rest, sedatives and anesthetics reduce the blood pressure to normal or nearly to normal. All that is needed to lower blood pressure in early phases of essential hypertension is a drug which produces prolonged vasodilatation but no harmful side effects. Preferably the drug should be effective when taken orally, but that is relatively unimportant. A drug with such an action is not now available, as far as I know. However, probably it can be made. Studies are in progress now.

Unfortunately, there is not much new to report in the medical treatment of essential hypertension but I shall briefly discuss the use of potassium thiocyanate, which is not new but has been much better controlled in recent years. Barker [2] has shown that the blood pressure of about 50 per cent of hypertensive patients is reduced by careful treatment with potassium thiocyanate. The amount of this drug which is administered should be determined by frequent calculations of the concentration of cyanate in the blood, which ordinarily should range between 8 and 12 mg. per hundred cubic centimeters. The technic has been described by Barker and has been modified by Griffith and Lindauer.[3] As little as 3 grains (0.2 Gm.) and as much as 12 grains (0.8 Gm.) of potassium thiocyanate must be administered orally each day to cause this concentration in the blood. Such symptoms as headache, insomnia and nervousness may be relieved whether or not blood pressure is reduced. Fatigue, microcytic anemia and enlargement of the thyroid gland may occur even if administration of the drug is well controlled. If concentration in the blood is too great, lethargy, mental confusion, weakness, difficulty of speech, cutaneous lesions and collapse may occur.

THROMBOPHLEBITIS, VENOUS INSUFFICIENCY, VARICOSE ULCER

There is not much essentially new in the treatment of thrombophlebitis but there has been wider recognition of the pathologic changes occurring in this disease and of the physiologic disturbances which result from it. Thrombophlebitis should be considered an episode of acute inflammation of a vein, resulting in thrombosis. It is improbable that there is ever chronic phlebitis, although phlebitis may appear recurrently. Treatment after the acute phase consists, therefore, of prevention

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1. This is an estimate. Reliable statistics on this subject are not available.

2. Barker, M. H.: The Blood Cyanates in the Treatment of Hypertension, J. A. M. A. **106**:762-767 (March 7) 1936; The Use of Cyanates in the Treatment of Hypertension, Wisconsin M. J. **36**:28-32 (Jan. 9) 1937; Results of Treatment of Thrombo-Angiitis Obliterans by Foreign Protein, J. A. M. A. **97**:841-843 (Sept. 19) 1931. Barker, N. W., and Roth, Grace M.: The Treatment of Occlusive Arterial Disease of the Legs by Means of the Sanders Vasocilator (Sanders Bed), Am. Heart J. **18**:312-317 (Sept.) 1939.

3. Griffith, J. Q., Jr., and Lindauer, M. A.: Thiocyanate Therapy in Hypertension Including a New Micromethod for Determining Blood Thiocyanates, Am. Heart J. **14**:710-716 (Dec.) 1937.

of venous stasis which may result and of prevention of recurrent episodes of phlebitis. Acute superficial phlebitis occurring spontaneously or in varices should be treated simply by rest and application of hot moist packs until there is no further extension of inflammation and until local signs of inflammation have disappeared. This is usually from seven to ten days. Sometimes roentgen therapy or the use of sulfanilamide hurries disappearance of inflammation. Prevention of recurrence of idiopathic phlebitis is largely unsatisfactory. Sometimes removal of foci of infection and cessation of smoking seem to help. In other instances, vaccines made from organisms cultured from the nasopharynx, prostate gland, teeth or tonsils seem to cause diminution in the number of episodes or of disappearance of them.

In the treatment of femoral and iliac thrombophlebitis one must consider (1) the possibility of pulmonary embolism, (2) management during the acute stage of the disease and (3) the prevention of chronic venous insufficiency of the limb. Once the signs and symptoms of femoral and iliac thrombophlebitis appear, the danger of pulmonary embolus is comparatively small. In their statistical study of 116 consecutive cases of fatal, postoperative, pulmonary embolism, Barker and Counseller [4] found that thrombophlebitis of the femoral and iliac veins which could be recognized clinically was present in only five cases. Conversely, in a series of fifty-four cases of postoperative femoral and iliac thrombophlebitis fatal pulmonary embolism occurred only once and small, nonfatal pulmonary emboli occurred in only three other cases. The danger of pulmonary embolus in clinically recognizable, postoperative femoral and iliac thrombophlebitis, therefore, usually seems to be dependent on a new episode of thrombosis in a different vein.

The treatment which Barker and Counseller have used during the acute stage of iliac and femoral thrombophlebitis is comparatively simple and consists of adequate elevation of the leg (to an angle of 30 degrees from the horizontal) obtained by using a back rest covered with pillows. Hot wet packs are applied continuously from the foot to the groin. Elevation of the leg and local application of heat are continued until the patient's temperature has remained normal for four days, until all swelling and edema have disappeared from the leg below the knee and until all pain and tenderness have disappeared from Scarpa's triangle and the region of the large veins distal to it. This usually requires from ten to eighteen days. We feel that it is not necessary to keep the patient in bed for a longer time and that prolonged periods of rest in bed favor rather than prevent the development of other episodes of thrombosis and embolism. Prolonged rest in bed also favors the development of atrophy of the muscles of the leg, osteoporosis and postphlebitic neurosis, which has been described by Allen and Brown.[5]

It is necessary to equip the patient with an adequate support for the affected leg as soon as he gets out of bed and to instruct him to use it consistently for a period of months. In the presence of partial venous obstruction, marked increase in venous pressure is likely to be responsible for the rapid development of chronic venous insufficiency, recurrent static edema, secondary varicose veins and subsequently even chronic cellulitis and ulceration of the skin. The manifestations of chronic venous insufficiency rarely, if ever, occur in the thigh. Hence it is not necessary to apply the support above the knee; furthermore, this is difficult and not practicable. It is necessary that the support prevent edema when the patient is standing and walking and that it be comfortable. Several types of support have been used. In cases of femoral and iliac thrombophlebitis the cloth and rubber are usually inadequate. Heavy elastic stockings may be adequate if they are made to measure and if they fit well. They have the disadvantages of being expensive, of wearing out or losing their elasticity in a few months and of not being adjustable. The most satisfactory support is a heavy, pure rubber bandage applied over a cotton stocking from the toes to the knee, with only a small portion of the heel exposed. The shoe should completely overlap the lower margins of the bandage. The advantages of this rubber bandage are that it will prevent orthostatic edema in practically all cases, that it can be adjusted until it is comfortable and that it is relatively inexpensive and does not wear out for a long time. Its disadvantages are that it is hot, particularly in the summer, that some patients, particularly women, object to its appearance as compared with that of an elastic stocking and that some skins are abnormally sensitive to rubber. The bandage or elastic stocking should be worn all the time that the patient is up and around. Each month the patient should go without the bandage for one day. Whenever edema does not occur, the support can be discarded.

The literature contains reports of several other measures which have been used in the treatment of thrombophlebitis during the acute state; namely, roentgen therapy, diuresis, application of leeches, dietary limitations and administration of sodium thiosulfate. Barker and Counseller have expressed the belief that results have not been any better in cases of postoperative thrombophlebitis when these measures have been used than when treatment consisted simply of adequate elevation of the limb, adequate application of moist heat to the limb, a comparatively short period of rest in bed and subsequently an adequate support for the leg. Leriche [6] expressed the opinion that thrombosis itself in thrombophlebitis does not cause the symptoms which are actually due to venospasm and arteriospasm, the former of which is responsible occasionally for discoloration of the limb and the latter of which causes pain and offers obstruction to the flow of blood.

Recently a good deal has been written and spoken about the treatment of deep phlebitis by anesthetization of the lumbar sympathetic nerve trunks because it seems desirable to relieve impaired arterial circulation, which apparently results from phlebitis. I wish to make three comments: 1. It has not been demonstrated that impaired arterial circulation adds to the disability resulting from acute phlebitis. 2. It has not been demonstrated that relief of arterial spasm hurries convalescence from acute phlebitis. 3. If it is desirable to relieve arterial spasm, anesthetization of the lumbar sympathetic nerves is almost the most unsatisfactory method because it is complicated and the results are of short duration. Application of hot packs to the involved limb is probably as satisfactory and much simpler. Other effective ways of inducing vasodilatation are immersion of a hand in water at 113 F., diathermy, environmental temperature of about 85 F. and direct

4. Barker, N. W., and Counseller, V. S.: Treatment of Postoperative Thrombophlebitis, Proc. Staff Meet., Mayo Clin. **13**:785-787 (Dec. 14) 1938.

5. Allen, E. V., and Brown, G. E.: Neurosis of the Extremities Following Phlebitis, M. Clin. North America **15**:123-127 (July) 1931; Intermittent Pressure and Suction in the Treatment of Chronic Occlusive Arterial Disease, J. A. M. A. **103**:2029-2034 (Dec. 21) 1935.

6. Leriche, René: Considérations sur le traitement chirurgical de la phlébite du membre inférieur et des ses séquelles éloignées, J. internat. de chir. **3**:585-598 (Nov.-Dec.) 1938.

application of heat to the body. I see no need for anesthetization of lumbar sympathetic nerves in acute phlebitis.

Nothing need be said here about the efficacy of the injection treatment of varicose veins; it is an accepted and usually successful method of treatment. Most interesting is the report of Duryee and Wright,[7] who stated that iontophoresis with a 0.5 per cent solution of acetyl-beta-methylcholine chloride (mecholyl) two to three times a week, for from six to 165 treatments, caused healing in nine cases of chronic varicose ulcer in spite of continuance of normal activity by all their patients. Kovacs [8] had pointed out previously that iontophoresis was a way to secure a better local effect of the mecholyl.

RAYNAUD'S DISEASE

Kraetzer [9] expressed the belief that Raynaud's disease may be due to chronic intoxication from arsenic. The urine of seven patients who had Raynaud's disease contained arsenic.[10] All were treated twice a week with intravenous injections of 0.5 Gm. of freshly prepared sodium thiosulfate for as long as twenty-two months or for as short a period as one month. Cure and marked improvement were noted. Kovacs, Saylor and Wright [11] reported that iontophoresis with mecholyl in solution, given from two to three times a week, caused increased warmth of and improved color of the hands and feet and lessening of frequency with which attacks of discoloration occurred in twelve instances of Raynaud's disease. Both of these methods should be tried extensively, particularly in cases of Raynaud's disease not cured by sympathectomy.

ARTERIAL EMBOLISM

It seems clear now that diminution of circulation occurring when an embolism lodges in an artery is due only partially to mechanical obstruction by the clot. More important is the diffuse regional arterial spasm which results and which greatly impairs circulation (McKechnie and Allen [12]). If this spasm can be relieved promptly, circulation can be restored to a fairly normal state without removing the embolus. Relief of spasm in the limb can be accomplished in some instances by intermittent suction and pressure, intermittent venous obstruction, anesthetization of sympathetic nerves, spinal or general anesthesia, increased environmental temperature, induction of fever and by other means. Certainly such relief often occurs spontaneously. Papaverine hydrochloride, which is an antispasmodic, vasodilating drug, may help greatly if injected intravenously or into the artery above the site of the embolus (Allen and MacLean [13]). Papaverine hydrochloride when given intravenously may benefit greatly the patient who has acute pulmonary embolism. Leriche, Fontaine and Friedman [14] expressed the belief that anesthetization of the stellate sympathetic ganglion may help by relieving spasm of pulmonary arteries in this condition. Unfortunately their reported results were not impressive. Patients who have cerebral thrombosis may perhaps be benefited by the same procedure or by injecting papaverine into the carotid artery. It should always be borne in mind that in cases of arterial embolism and of sudden arterial thrombosis the chief therapeutic indication is to cause vasodilatation to relieve the regional arterial spasm commonly resulting from sudden arterial occlusion. Collins [15] reported that fifteen of seventeen patients who had severe, massive, postoperative pulmonary embolism recovered following the use of papaverine. Six of seven patients who had embolism of the arteries of the extremities recovered. It is to be hoped that others have as good results as Collins has had. Our results are not nearly as impressive as those of Collins but I do believe there is some merit in this type of treatment. Papaverine hydrochloride one-half grain (0.032 Gm.) is about the right amount to inject intravenously or intra-arterially. More can be given with caution. Injections can be repeated every hour or so, depending on the reaction of the patient.

THROMBO-ANGIITIS OBLITERANS

Cessation of Smoking.—Hardly new, but well worth emphasizing again, is the great importance of complete cessation of smoking by patients having thrombo-angiitis obliterans. It is well known that tobacco smoking causes impairment of arterial circulation, manifested in the extremities by decreased cutaneous temperature, in the general condition by increased blood pressure and in the eyes by visible arterial constriction. These changes in circulation are, to be sure, transient but, when a patient smokes heavily, impairment of circulation may be persistent during hours in which the patient smokes. Abnormal arterial and arteriolar constriction is far removed pathologically from organic arterial changes, yet there is evidence that prolonged spasm such as that induced by ergot may produce organic changes in arteries. Friedlander, Silbert and Laskey [16] have shown that an extract of commercially denicotinized cigarets in Ringer's solution, injected intraperitoneally into male albino rats, may cause gangrene of the toes. One of the six rats subjected daily to inhalation of tobacco smoke for five months was afflicted with gangrene of the toes and one of ten animals treated by daily intraperitoneal injections of alkaloid nicotine tartrate also developed gangrene. Furthermore, Helmer, Kohlstaedt and Page [17] have shown that the blood and urine of tobacco smokers may contain rather large amounts of nicotine, which may produce organic changes in some way as yet not understood. More important than any of these considerations, however, is the often repeated clinical observation that patients having thrombo-angiitis obliterans who continue to smoke do not ordinarily improve as much as do patients who cease smoking. It is difficult to impress on patients the importance of stopping smoking.

7. Duryee, A. W., and Wright, I. S.: The Treatment of Scleroderma by Means of Acetyl-Beta-Methylcholine Chloride (Mecholyl) Iontophoresis, Am. Heart J. **14**: 603-613 (Nov.) 1937.

8. Kovacs, Joseph: The Iontophoresis of Acetyl-Beta-Methylcholine Chloride in the Treatment of Chronic Arthritis and Peripheral Vascular Disease: Preliminary Report, Am. J. M. Sc. **188**: 32-36 (July) 1934.

9. Kraetzer, A. F.: Raynaud's Disease: A Hypothesis as to Its Cause, New York State J. Med. **35**: 1130-1136 (Nov. 15) 1935.

10. Hines, E. A., Jr.: Personal communication to the author. Dr. Hines, of the Mayo Clinic, found no significant amount of arsenic in the urine of seven patients with Raynaud's disease.

11. Kovacs, Joseph; Saylor, L. L., and Wright, I. S.: The Pharmacological and Therapeutic Effects of Certain Choline Compounds: Results in the Treatment of Hypertension, Arthritis, Organic Occlusive Vascular Disease, Raynaud's Disease, Scleroderma and Varicose Ulcers, Am. Heart J. **11**: 53-65 (Jan.) 1936.

12. McKechnie, R. E., and Allen, E. V.: Sudden Occlusion of the Arteries of the Extremities: A Study of 100 Cases of Embolism and Thrombosis, Surg., Gynec. & Obst. **62**: 231-240 (Aug.) 1936; Effect on the Circulation of Mechanical Occlusion of Individual Arteries of the Extremities: Relation to Arterial Embolism, Am. Heart J. **14**: 127-134 (Aug.) 1937.

13. Allen, E. V., and MacLean, A. R.: Treatment of Sudden Arterial Occlusion with Papaverine Hydrochloride, Proc. Staff Meet., Mayo Clin. **10**: 216-220 (April 3) 1935.

14. Leriche, René; Fontaine, René, and Friedman, Léon: L'infiltration stellaire est-elle justifiée dans l'embolie pulmonaire du point de vue physiologique et anatomopathologique? Quelle place doit-elle occuper dans la thérapeutique de cette affection? J. de chir. **50**: 737-748 (Dec.) 1937.

15. Collins, D. C.: The Value of Papaverine Hydrochloride in the Treatment of Arterial Embolism, M. Rec. **148**: 186-190 (Sept. 7) 1938.

16. Friedlander, Mae; Silbert, Samuel, and Laskey, Norman: Toe Lesions Following Tobacco Injections in Rats, Proc. Soc. Exper. Biol. & Med. **34**: 156-157 (March) 1936.

17. Helmer, O. M.; Kohlstaedt, K. G., and Page, I. H.: The Isolation of Nicotine from Human Urine, Am. Heart J. **17**: 13-20 (Jan.) 1939.

To do so I tell them "You can have your legs or your tobacco but not both." Subsequently I qualify the statement.

Intravenous Injection of Typhoid Vaccine.—In several clinics the repeated intravenous injection of typhoid vaccine to induce fever and to effect vasodilatation has been the most successful method of treatment of thrombo-angiitis obliterans. In a report of 150 cases in which treatment was administered by this method, Barker [18] wrote that in 86 per cent pain while the patients were at rest was relieved if ulceration was absent, healing of ulcers occurred in 86 per cent, and healing of gangrene limited to the toes in 65 per cent. In 76 per cent of all cases repeated intravenous injections of typhoid vaccine to induce fever caused marked improvement. Barker pointed out that definite vasodilatation in the extremities could be demonstrated and that relief of pain was of a greater degree than could be explained by induced vasodilatation. This method of treatment has the advantage of simplicity and cheapness. It requires no machinery, which is perhaps one reason why it does not appeal more strongly to physicians or patients. I consider it the best of all methods of treatment in many cases of thrombo-angiitis obliterans.

Sulfanilamide.—Administration of this drug has proved useful in treatment of the acute or subacute infections so often associated with ulcerated or gangrenous lesions of thrombo-angiitis obliterans, and in treatment of acute phlebitis. Patients who have thrombo-angiitis obliterans who are under close observation should be treated with sulfanilamide or neoprontosil given regularly or intermittently over long periods. There is excellent opportunity for such a study to determine whether thrombo-angiitis obliterans is due to infection which can be minimized or eliminated by sulfanilamide.

Sodium Iodide Thiosulfate.—This drug has been recommended by Rabinowitz,[19] because in his opinion it palliates the deleterious effects of anoxemia by increasing absorption of oxygen by the tissues, lengthens coagulation time, diminishes the tendency to thrombosis and converts choline into nontoxic compounds. Rabinowitz gave 50 grains (3.3 Gm.) of sodium iodide thiosulfate intravenously every other day for three weeks and twice a week thereafter for two months. All foods rich in phospholipins were eliminated from the diet. As a result of this treatment, pain disappeared and healing of gangrenous lesions occurred in sixty-three cases of thrombo-angiitis obliterans. As yet I have not seen reports by others of similar results, and we at the clinic have not benefited patients in a limited trial of treatment with sodium iodide thiosulfate.

A Proprietary Pancreatic Preparation (padutin).—Loeweneck and Madlener [20] gave slow intravenous infusions, over a period of from eight to ten hours, of 40 to 80 units of padutin in from 1 to 2 liters of physiologic solution of sodium chloride and repeated the injection every few days. Between periods of slow intravenous infusion, single injections of the preparation were given. The investigators noted relief of pain, improvement in arterial pulsations, increased warmth of skin and improvement in ulceration in thrombo-angiitis obliterans. This method of treatment should be given further trial.

18. Barker (footnote 2, third reference).
19. Rabinowitz, H. M.: The Use of Sodium Iodide Thiosulfate (Activated Sulfur) in Treatment of Thrombo-Angiitis Obliterans, J. Chemotherapy **13**:1-4 (April) 1936.
20. Loweneck, M., and Madlener, M.: Intravenöse Dauerinfusion von Padutin, Deutsche Ztschr. f. Chir. **248**:700-707 (March) 1937.

ARTERIOSCLEROSIS

Frequently the concentration of fats in the blood is definitely increased. A quick conclusion is that the arterial changes are due to the increased concentration of fats or that the two result from a common cause. Leary [21] has maintained that atherosclerosis results directly from impaired metabolism of cholesterol. Huber, Broun and Casey [22] have shown that atherosclerosis, easily induced in rabbits by feeding cholesterol, can be prevented by administration of a pancreatic extract (lipocaic) which also prevents increase in the concentration of cholesterol in the blood. The pancreas may have another hormone in addition to insulin which is specific for metabolism of fat and this hormone may be perverted in quality or diminished in quantity in some cases of arteriosclerosis obliterans, producing both hyperlipemia and atherosclerosis. Perhaps ingestion of too much fat and cholesterol is responsible. Much can be expected from researches in this field in the near future. Leary quoted Shields and White to the effect that reduction of fat and cholesterol in the diet of diabetic patients reduces the incidence of atherosclerosis to normal and that a similar arrangement of diet causes xanthomas and roentgenologic evidence of arteriosclerosis to disappear. There is no close agreement on this matter. It is certain that elimination of sources of animal fats, that is eggs, milk and its products, and fat meats, from the diet has reduced greatly the concentration of the fats in the blood in many instances of hyperlipemia. It is worth trial in all cases in which the quantity of fats in the blood is increased.

COMMON METHODS OF TREATMENT OF BOTH ARTERIOSCLEROSIS OBLITERANS AND THROMBO-ANGIITIS OBLITERANS

The Sanders Bed.—Barker and Roth [2] have studied the results of treatment of eighty-eight patients having chronic occlusive arterial diseases by means of the oscillating Sanders bed. The results may be summarized as follows:

1. Relief of simple rest pain: Twelve of thirteen patients were completely relieved during treatment. Eleven of thirteen patients were permanently relieved by treatment.[23]

2. Relief of pain of ischemic neuritis: Nine of fifteen patients were completely relieved during treatment. All fifteen patients were relieved by continued treatment.

3. Relief of pain associated with ulcers and gangrene: Thirty-two of forty-four patients were completely relieved during treatment. Twenty-two of forty-four patients were permanently relieved by treatment.[24] Healing occurred for all these patients.

Of thirty-four patients who were relieved during treatment on the Sanders bed, twenty-one were either not relieved or their pain was made worse by intermittent suction and pressure. Three patients were relieved by passive vascular exercise and not by treatment on the Sanders bed, while nine patients were relieved of pain equally by the two measures and eight were relieved by neither form of treatment.

The principle of treatment by the Sanders bed is that of passive postural exercises which allow intermittent filling and emptying of capillaries, venules and probably of arterioles. There is not much conclusive objective evidence that the circulation is improved, although the cutaneous temperature and oscillometric index may be increased.

21. Learry, Timothy: Atherosclerosis; Etiology, Arch. Path. **21**:459-462 (April) 1936.
22. Huber, M. J.; Broun, G. O., and Casey, A. E.: Prevention of Cholesterol Arteriosclerosis in the Rabbit by Use of Pancreatic Extract (Lipocaic), Proc. Soc. Exper. Biol. & Med. **37**:441-443 (Dec.) 1937.
23. Six patients had other treatment.
24. Ten had other treatment.

Intermittent Venous Compression.—Reports of value differ greatly, varying from those indicating that the method has no value whatever to those indicating remarkable improvement in the status of patients who have chronic occlusive arterial diseases. By using either a specially constructed machine or an ordinary blood pressure cuff manually, the limb is compressed for two minutes and then the pressure is released for two minutes. Patients who have open lesions are treated continuously day and night, and the cuff is inflated to from 30 to 40 mm. of mercury. After three days, treatment is reduced to from eight to ten hours daily. Patients who have no open lesions are treated continuously, pressures as high as from 60 to 80 mm. of mercury being used. Compression and release alternate for several hours daily. The treatment is based on the observation that hyperemia follows release of venous compression. There is some (but inconclusive) evidence of increased blood flow. The supporters of the method believe that treatment carried out for many hours produces persistent increases in circulation in contrast to the transient hyperemia which follows simple release of venous compression.

Collens, Wilensky and Ginsberg [25] reported the healing of 71 per cent of patients having gangrene and ulceration due to thrombo-angiitis obliterans, and relief of pain in 85 per cent of cases. Better results occurred in the treatment of nondiabetic patients having arteriosclerosis obliterans, but the results were less good in the treatment of diabetic patients having arteriosclerosis obliterans. Seven patients who had acute embolus and arterial thrombosis were relieved of pain, four recovered completely, two died but did not require amputation, and one patient required amputation. De Takats [26] reported that coldness and numbness of the extremities are relieved first, that intermittent claudication is influenced little and slowly and that "rest pain, if present, is a sign of serious circulatory disturbance and at this stage little can be expected from such treatments." He differed, therefore, with Collens and Wilensky, who reported marked relief of rest pain. Some physicians who have used intermittent venous occlusion adequately say that it has no value as a therapeutic method. I have had inadequate experience with it, but I doubt that the method has much virtue.

Kountz and Smith [27] used five cuffs to increase the venous pressure. The pressure was usually 40 mm. of mercury in the most proximal cuff and about 20 mm. of mercury in the other cuffs. The system is inflated and deflated about every six minutes for two hours a day. Improvement was noted in the condition of patients having thrombo-angiitis obliterans and arteriosclerosis obliterans, but unfortunately for dispassionate evaluation of the method of treatment several other forms of treatment were administered simultaneously.

Intermittent Arterial Compression.—Thiele [28] described a method of compressing the arteries to an extremity by means of an ordinary sphygmomanometer. The pressure in the cuff is maintained above the systolic blood pressure for five, ten or fifteen minute periods and is then rapidly deflated for ten or fifteen minutes before reinflation. According to Thiele, such manipulation causes hyperemia. The cycle of inflation-deflation is repeated from five to eight times during one course of treatment.

Theoretically, according to Thiele, during the stage of compression the blood flows into the veins, the vessels collapse, metabolic changes occur and the blood vessels dilate. At the beginning of treatment little or delayed rubor occurs when the cuff is deflated and moves distalward slowly. After some treatment the reactionary rubor occurs promptly and intensively and quickly involves the entire extremity. Thiele reports relief of pain and restoration of circulation in two cases of arteriosclerosis obliterans and in other cases in which the diagnoses were vascular spasm with hypertension, angiospasm and dyspraxia angiospastica. Interestingly, patients having chronic arthritis were greatly benefited. The method is worthy of more extensive trial. It is perhaps a sign of unwarranted skepticism that causes one to doubt that the results will be as good as indicated by Thiele.

Diathermy.—Bennett [29] and others have emphasized the effectiveness of short wave diathermy in producing peripheral vasodilatation. Application is made to the lumbar region by means of a cable or by applying one pad to the lumbar region and the other to the lower portion of the abdomen or to a thigh. In the presence of chronic occlusive arterial diseases the cutaneous temperature begins to increase in about fifteen to twenty minutes and reaches a maximum in, roughly, a similar period of time. When diathermy is discontinued, the cutaneous temperature of the toes of a patient clad with only a sheet decreases in about forty-five minutes to that value which had obtained before institution of the treatment. If the patient is wrapped in blankets, peripheral vasodilatation may persist for several hours, since the oral temperature increases as much as 3 degrees F. (approximately 2 degrees C.) and this fever persists for some time, provoking peripheral vasodilatation. Extensive observations have not yet been made on the relief of pain and clinical improvement. It is unfortunate that the vasodilatation induced by short wave diathermy persists so briefly, but it is no more illogical to assume that permanent vasodilatation may result from this form of treatment than it is to assume that permanent vasodilatation may result from intermittent venous or arterial compression or from intermittent suction and pressure. Diathermy has a contrasting advantage over many other forms of treatment in that it obviously produces an increase in the flow of blood.

Administration of Sodium Chloride by Mouth and Intravenously.—Sandstead and Beams [30] noted that the oral administration of sodium chloride causes relief of pain caused by neuritis and impaired circulation in the presence of diabetes, and definite signs of improvement in circulation, such as healing of gangrenous ulcers and indolent ulcers, and improvement in the color and temperature of the feet. These authors gave from 15 to 90 Gm. of sodium chloride daily over periods of ten to fourteen days, with interruptions of ten to fourteen days. They felt that the beneficial effects were the result of vasodilatation induced by the ingestion of

25. Collens, W. S.; Wilensky, N. D., and Ginsberg, Hyman: Intermittent Venous Occlusion in Peripheral Vascular Disease: Study of Its Physiologic Mechanism and Therapeutic Effects, Arch. Phys. Therapy **19**: 261-271 (May) 1938. Collens, W. S., and Wilensky, N. D.: Intermittent Venous Occlusion in Treatment of Peripheral Vascular Disease: An Experience with 124 Cases, J. A. M. A. **109**: 2125-2130 (Dec. 25) 1937.

26. de Takats, Geza: Intermittent Venous Hyperemia for the Treatment of Peripheral Vascular Disease, Physiotherapy Rev. **18**: 7-8 (Jan.-Feb.) 1938.

27. Kountz, W. B., and Smith, J. R.: Observations on Passive Vascular Exercise and Other Forms of Treatment of Peripheral Vascular Disease, Am. Heart J. **16**: 53-65 (July) 1938.

28. Thiele, Wolfgang: Ueber die Behandlung mit aktiver nach Ganter, München. med. Wchnschr. **85**: 988-990 (June 30) 1938.

29. Bennett: Personal communication to the author.

30. Sandstead, H. R., and Beams, A. J.: Relief of Diabetic Pain of Neurocirculatory Origin by Oral Administration of Sodium Chloride, Arch. Int. Med. **61**: 371-380 (March) 1938.

salt, although they showed no evidence of such an effect. Silbert [31] advised repeated intravenous injections of hypertonic solutions of sodium chloride for patients having thrombo-angiitis obliterans. An initial injection of 150 cc. of a solution of 5 per cent sodium chloride is administered and all subsequent injections are 300 cc. of a 5 per cent solution, given at the rate of about 30 cc. per minute. At first injections are given on alternate days, later twice a week, and still less frequently as improvement occurs. Treatment is continued for from six weeks to two years. As a result of this method of treatment, to which were added occasional nerve section for relief of pain, and cessation of smoking, the incidence of amputation was decreased from 62 per cent to 6.4 per cent. Silbert believes that thrombo-angiitis obliterans is not a progressive disease when patients stop smoking. Samuels [32] has confirmed Silbert's observations relative to the beneficial effects of a repeatedly injected solution of 5 per cent sodium chloride. Although some observers are not enthusiastic about the treatment outlined by Silbert and by Samuels and are frankly skeptical of the therapeutic results, it is apparent that patients receiving this treatment from these two investigators have improved remarkably. As in many other situations, it is difficult to determine whether or not the improvement was due to this treatment alone.

The Administration of Sodium Citrate Orally or Intravenously.—Bernheim and London [33] reemphasize the value of administration of sodium citrate, of which 250 cc. of a 2 per cent solution is administered intravenously as often as daily for as long as six months but on an average of only three months. It may be administered orally also. When cessation of smoking, a diet high in calcium and vitamins, avoidance of worry, and diminished physical activity were added to this method of treatment of fifty-four patients having thrombo-angiitis obliterans and ninety-nine patients having arteriosclerosis obliterans, excellent results followed. Intermittent claudication was benefited in about 75 per cent of cases, rest pain was relieved in about 80 per cent of cases and ulcers were improved in about 85 per cent of cases. These authors believed that the administration of sodium citrate reduced viscosity and fibrinogen of the blood and increased the excretion of calcium. If I read their charts correctly, all five patients having thrombo-angiitis obliterans were improved by dietary treatment alone, as were thirty of thirty-one patients who had arteriosclerosis obliterans. One wishes that Drs. Bernheim and London had studied a group of patients for whom even a diet was not prescribed. Would the results have been as good?

Intermittent Suction and Pressure.—This method of treatment has been much favored since it was redescribed by Herrmann [34] and by Landis and Gibbon [35] in 1933. Herrmann devised the machine which is now used commonly for the improvement of circulation in occlusive arterial diseases by intermittently decreasing and increasing the environmental pressure around the extremities. He believed that pressure should be equivalent to about 20 mm. of mercury and that it should endure for about three seconds, while suction should be equivalent to about 80 mm. of mercury and endure about twelve seconds. The treatment is intended to dilate collateral arterial pathways and thus improve circulation. Herrmann reported the recovery of six of seven patients who had arterial embolism, all of fourteen patients who had acute arterial thrombosis, improvement of intermittent claudication in many instances, relief of pain and healing of gangrenous ulcers in twenty of twenty-one patients who had advanced thrombo-angiitis obliterans, and much improvement in the condition of patients who had arteriosclerosis obliterans. Excellent results in treating such patients were reported in previous publications. Unfortunately the method of classification of occlusive vascular diseases as presented in Herrmann's monograph is so unorthodox and the presentation of results of therapy is so indefinite that the reader cannot evaluate results of treatment for himself. Various other students of peripheral vascular disease have not agreed that Herrmann's ingenious method of treatment is of first class therapeutic benefit.

Kountz and Smith,[27] for example, found that definite improvement followed treatment of only one of seventeen patients who had arteriosclerosis obliterans, and very minor improvement of only two of eight patients who had thrombo-angiitis obliterans. There were no notable changes in the oscillometric index, and injections of colloidal thorium dioxide showed no improvement in the collateral circulation. Brown and I [5] did not find intermittent suction and pressure method of treatment of much clinical value. Wilson and Roome [36] reported twelve cases of arteriosclerosis obliterans with subjective improvement in five instances but no permanent objective evidence of improvement. Of eight patients who had thrombo-angiitis obliterans, six were not benefited; intermittent claudication was improved in two instances.

Holman [37] modified the boot devised by Herrmann so that it could be applied directly to the thigh. The pressure within the chamber alternates every five seconds from −70 to +50 mm. of mercury. Holman believed that such a chamber exerted its influence on undiseased vessels instead of on occluded arteries, as the passive vascular exercise boot does, and he pointed out that it could be used in the presence of infection and when pain made the boot intolerable. Holman felt that the thigh chamber was actually a peripheral heart which draws blood into the extremity during the phase of suction and which forces blood into the peripheral arteries during the phase of pressure. I doubt that this opinion can be supported by physiologic evidence. He wrote that the clinical results obtained from treatment with the suction pressure chamber applied to the thigh were better than those obtained with passive vascular exercise. Too few results have been presented to allow evaluation of the method by the reader.

SUMMARY DISCUSSION OF METHODS OF TREATMENT OF CHRONIC OCCLUSIVE ARTERIAL DISEASES

When one reads of the results of various methods of treatment for chronic occlusive arterial diseases, two things are impressive. The reported results are surprisingly good and the reported results of one particular method of treatment duplicate surprisingly the reported

31. Silbert, Samuel: Amputations in Thrombo-Angiitis Obliterans, S. Clin. North America **18**: 389-403 (April) 1938.
32. Samuels, S. S.: The Conservative Treatment of Thrombo-Angiitis Obliterans, Lancet **2**: 1511-1513 (Dec. 26) 1936.
33. Bernheim, Alice, and London, Isabel: Arteriosclerosis and Thrombo-Angiitis Obliterans: Report of Cases and Treatment, J. A. M. A. **108**: 2102-2109 (June 19) 1937.
34. Herrmann, L. G.: Passive Vascular Exercises, London, J. B. Lippincott Company, 1936.
35. Landis, E. M., and Gibbon, J. H., Jr.: Effects of Alternate Suction and Pressure on Circulation in the Lower Extremities, Proc. Soc. Exper. Biol. & Med. **30**: 593-595 (Feb.) 1933.
36. Wilson, Harwell, and Roome, N. W.: Passive Vascular Exercise: Observations on Its Value in the Treatment of Peripheral Vascular Disease, J. A. M. A. **106**: 1885-1888 (May 30) 1936.
37. Holman, Emile: Recognition and Treatment of Peripheral Vascular Occlusion, Northwest Med. **37**: 65-71 (March) 1938.

results of other methods of treatment This correlation can be explained in several ways. Perhaps the results are as good as reported because of specific methods of treatment and perhaps the surprising correlation of good results of individual methods of treatment is due to the fact that only a certain percentage of patients can be benefited. Perhaps also there is too much enthusiasm on the part of the investigator who reports good results either because he has a definite pride in the method which he has originated or because he is not sufficiently experienced to exercise cautious judgment. This would appear to be definitely true when other students cannot confirm the good results of a specific method of treatment. Perhaps the specific method of treatment is not responsible at all for improvement or, if it is, it is responsible only remotely, while most benefit originates from good general care such as cessation of smoking, rest in bed, warmth and comfort.

The number of reported cures for chronic occlusive arterial diseases indicates that the field of vascular diseases has come of age. It is now almost on a par with gastro-enterology, for example, since there are, similarly, many "cures" for duodenal ulcer. It is well to emphasize that almost all the good reports of treatment of thrombo-angiitis obliterans are based on clinical results, a shaky foundation at best when numerous factors must be considered. There is surprisingly little objective evidence to support the conclusion that much of the treatment causes a definite increase in the flow of blood to extremities deprived of blood. Even if an individual treatment causes increased circulation transiently, one cannot conclude that repeated treatments cause a permanent increase in circulation unless there is definite objective evidence that this is true.

That which has been said in the foregoing paragraphs is relatively unimportant. Much more important is the fact that progress is being made in treatment, even if by chance it is not as great as some reports indicate. There is still much to be accomplished, for Horton [38] has shown that many patients receive little or no treatment and that, of these, about 60 per cent will require amputation within ten years' time. It is only when this percentage is greatly reduced that we of the medical profession can have much pride in our treatment of chronic occlusive arterial diseases.

38. Horton, B. T.: The Outlook in Thrombo-Angiitis Obliterans, J. A. M. A. **111**: 2184-2188 (Dec. 10) 1938.

Food, Fun and Frolic.—Apart from disease of the central nervous system and grave physical defects, the prevailing notions as to the relation of mens sana and corpus sanum have been grossly exaggerated. Malnutrition, poverty, dirt, and even a succession of acute or chronic diseases do not seem able of themselves to subdue the master organ of the body, the brain, to any considerable extent. On the other hand it is obvious that malnutrition, poverty, dirt, disease and war do wipe out individuals, families and races. The effect on the race or the breed should not be confused with the effect on the brain of the individual. The psychological effects of class gymnastics have not been considered any more than the psychological effects of grooming, dress and personal adornment. The present problem is anatomical and physiological. Growth, development, posture, like health, depend to a large extent on the freedom for the individual to join in any play, game or sport, to exert himself according to his powers, and to know when he has had enough. Food, fun and frolic are of more importance than drill and discipline. —Harris, H. A.: The Anatomical and Physiological Basis of Physical Training, *Brit. M. J.*, Nov. 11, 1939.

VITAMIN A IN THE BLOOD OF NORMAL ADULTS

THE EFFECT OF A DEPLETION DIET ON BLOOD VALUES AND BIOPHOTOMETER READINGS

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Many problems concerning the human requirement for vitamin A could be solved if a reliable measure of subclinical vitamin A deficiency were found. The biophotometer test has been suggested for this purpose, but work in this as well as in other laboratories has shown that the test is only fairly reliable and that its relation to stores of vitamin A has yet to be demonstrated. A review of the literature suggests that determinations of vitamin A in the blood may offer another approach to this problem. The present study was consequently undertaken. It includes the results of chemical determinations of vitamin A and of carotene in the blood, as well as biophotometer tests, of five subjects over periods of from two to four months. During this period four of the subjects lived on vitamin A depletion diets save for two short periods of supplementation; the fifth served as the control. Single determinations were also made of the vitamin A and carotene in the blood of thirty-four adults in order to have some idea of the range of values found in normal subjects. Our purpose in this study, as already indicated, was to determine whether the level of vitamin A in the blood is closely related to the body's stores of this vitamin.

LITERATURE

During the last few years a number of studies on the vitamin A and carotene content of human blood have appeared in the literature. With the exception of the work of Clausen and his associates [1] these studies have all been done in foreign countries. The material as a whole is quite heterogeneous in nature as it includes subjects of all ages, races and classes and in various states of health. Furthermore, there is no uniformity in the methods used by the various investigators. Several modifications of the antimony trichloride method for determining vitamin A have been made and the vitamin A equivalents of the "blue units" reported vary with the modification used; the absolute values reported by the various laboratories, therefore, are not strictly comparable. Few of the reports mention whether or not fasting blood was used and in no case are there any quantitative data as to the nature of the diets of the subjects. For these reasons the results of most of the studies are not pertinent to the present problem and will therefore not be reviewed here. Since, however, the extent of the studies and certain of their general conclusions are of interest, they are summarized in table 1.

It will be noted that these studies present but little direct evidence as to whether or not the vitamin A in

From the Department of Home Economics, the University of Chicago. Helen Parkes took all the blood samples and Drs. Clausen and McCoord helped the authors with the method.

1. Chesney, Jack, and McCoord, A. B.: Vitamin A of Serum Following Administration of Haliver Oil in Normal Children and in Chronic Steatorrhea, Proc. Soc. Exper. Biol. & Med. **31**: 887-888 (April) 1934. Clausen, S. W., and McCoord, A. B.: The Carotenoids and Vitamin A of the Blood, J. Pediat. **13**: 615-630 (Nov.) 1938. McCoord, A. B., and Luce-Clausen, Ethel M.: The Storage of Vitamin A in Liver of the Rat, J. Nutrition **7**: 557-572 (May) 1934.

the blood is related to the body's stores, although several of the authors assume that such a relationship exists. Certain indirect evidence on which there is general agreement make this assumption seem logical: 1. Subjects suffering from a definite vitamin A deficiency have little or no vitamin A in their blood. 2. Subjects from low socio-economic groups, whom one would expect to have poor stores, have on the average less vitamin A in their blood than subjects from the higher socio-economic groups. It is obvious, however, that the significance of these observations cannot be settled until more controlled studies have been made in which the vitamin A and carotene are determined on the fasting blood of normal subjects on a known intake of vitamin A over a long enough period to determine the expected variation. The present study was undertaken as a contribution to this problem.

TABLE 1.—*Summary of the Studies Reported in the Literature on the Vitamin A and Carotene in Human Blood Which Are Most Pertinent to This Study*

Investigator	Subjects	Most Pertinent Observations
Connor, C. L.: Studies on Lipochromes, J. Biol. Chem. 77:619-626 (May) 1929	2 normal 18 diabetic 36 miscellaneous	Carotene varied from 0.0 to 0.11 mg. per 100 cc.
White, F. D., and Gordon, E. M.: Estimation of Serum Carotene, J. Lab. & Clin. Med. 17:53-59 (Oct.) 1931	14 diabetic 18 normal 8 pathologic not diabetic	The blood of the diabetic contained more carotene than that of the nondiabetic. The carotene in the blood depended on the amount in the diet
Menken, J. G.: Die Bestimmung des Vitamin A-Gehaltes im Blutserum des Menschen, Deutsche med. Wchnschr. 58:1484 (Sept. 16) 1932	100 subjects of varying socio-economic status	The blood from the low socio-economic group showed much less carotene and vitamin A than that from the middle group; the amount of vitamin A and carotene in the blood is related to the amount in the food
Kaufman, F., and von Drigalski, W.: Untersuchen über Carotin-Vitamin A im menschlichen Organismus, Klin. Wchnschr. 12:296-299 (Feb. 25) 1933	1,000 subjects	85 per cent of the subjects showed less than 0.01 mg. per 100 cc. of carotene. Improvement of diet caused a rapid increase in the carotene in blood
Chesney, Jack, and McCoord, A. B.: Vitamin A of Serum Following Administration of Halibut Oil in Normal Children and in Chronic Steatorrhea, Proc. Soc. Exper. Biol. & Med. 31:887-889 (April) 1934	Children, normal and celiac	In normal children a concentrate of vitamin A caused a rapid rise in the amount in the blood; a maximum about 9 times the fasting level was reached in 4 hours; after 24 hours the level was still 50 per cent above the original fasting level
Wendt, H.: Beiträge zur Kenntnis des Carotin und Vitamin A-Stoffwechsels, Klin. Wchnschr. 14:9-14 (Jan. 5) 1935	More than 50 normal diabetic hyperthyroid	The maximum blood level reached after a supplement of vitamin A or carotene was dependent on the original blood level but was not maintained when large supplements were continued
Schneider, E., and Widmann, E.: Der Carotin und Vitamin A Spiegel im menschlichen Serum, Klin. Wchnschr. 14:670-673 (May 11) 1935	100 subjects, aged 10-80 years	Carotene tended to rise with age and vitamin A to fall
Wolff, L. K.: Die chemische Bestimmung der Vitamine A und C im Blut, Harn, Organen, und Lebensmitteln, sowie ihre Bedeutung für die Ernährungsfrage, Schweiz. med. Wchnschr. 65:979-985 (Oct. 19) 1935	40 students 67 patients 80 unemployed	The unemployed showed the lowest blood values; suggested standards: good, 60-80 international units per 100 cc. serum; satisfactory, 30-60 international units; unsatisfactory, less than 30 international units
Sie, B. L.: Untersuchen über den Vitamin A Gehalt des Blutes von Einigen Patienten mit A-Avitaminotischen Augensymptomen, Arch. f. Augenh. 110:610-619, 1937	16 with avitaminosis A, 30 normal	The blood values for the patients with ocular symptoms of hypovitaminosis A were significantly low
Marchionini, A., and Patel, C.: Klinische und experimentelle Untersuchungen über den Vitamin A und Carotingehalt des menschlichen Blutserums bei Hautkrankheiten, Arch. f. Dermat. u. Syph. 175:419-437 (April) 1937	130 normal 145 with cutaneous disorders	A much higher incidence of low values was found in the subjects with cutaneous disorders
Dost, F. H.: Zur Methodik der Stufenphotometrischen Bestimmung des Vitamins A im menschlichen Blut, Klin. Wchnschr. 16:273-275 (Feb. 20) 1937	15 sick children 10 normal	Found lower values for the sick children
deHaas, J. H., and Meulemans, O.: Vitamin A and Carotenoids in Blood Deficiencies in Children Suffering from Xerophthalmia, Lancet 1:1110-1111 (May 14) 1938	11 infants and 17 children with xerophthalmia	No, or very little, vitamin A was found in the blood of these subjects. A supplement increased the vitamin A more or less rapidly
Clausen, S. W., and McCoord, A. B.: The Carotenoids and Vitamin A of the Blood, J. Pediat. 13:625-650 (Nov.) 1938	Over 1,400 subjects mostly children; various pathologic conditions	(1) Individual determinations vary greatly; (2) the rate of absorption of vitamin A is slower than that for carotene; (3) infection causes a decrease in vitamin A and carotene; (4) when the carotene intake is diminished the blood level falls slowly

METHOD

The general plan of the study, as previously stated, was to place a group of subjects on a diet as low as possible in vitamin A and to note the effect of such a diet, with and without small supplements, on the blood level of vitamin A and carotene and on the biophotometer readings. To support these data single samples of blood were taken from thirty-four adults, half of whom had been receiving a supplement of vitamin A.

Subjects.—Four subjects were used to test the effect of a vitamin A low diet on the blood level of carotene and vitamin A. These four experimental subjects were college students. They were in good physical health and with fair or good dietary histories. There was no doubt, however, that subject G. S. had been receiving the most vitamin A, since several months previously she had taken large amounts of vitamin A concentrate. Subject E. S., on the other hand, had probably been receiving slightly less vitamin A than the other subjects, since her diet included few dairy products or eggs. The one control subject used for this portion of the study was also a college student with a good dietary background.

The thirty-four subjects from whom single samples of blood were obtained were volunteers, either university students or employees. While an attempt was made to secure some idea of their dietary histories, the records were not quantitative and therefore were of little value in ascertaining the amount of vitamin A that these subjects had been consuming, except in the case of those who were taking concentrates. Thirty-one of these thirty-four subjects were given two or more biophotometer tests each.

Plan of the Experiment.—The experiment consisted of a long depletion period, 123 days, which was preceded and followed by a week of an adequate diet containing between 7,000 and 10,000 units of vitamin A daily. During the depletion period the subjects ate all their meals in the laboratory. While no assays were run, the diet as calculated averaged 67 units of vitamin A daily. All the food eaten, including the breads and cakes, was prepared in the laboratory. The diet was

weighed and each subject ate identical amounts of any food which contained vitamin A or carotene.

Three of the subjects continued on this vitamin A low diet for the entire period of more than four months, the fourth subject for fifty-two days. The three subjects each received six small supplements [2] of 1,000 units of vitamin A, the first on the sixty-fifth, the others on the seventy-second to the seventy-sixth days. The fourth subject, E. S., was given 2,000 units daily during her last week on the experiment.[3]

The blood samples for the study were taken in the morning before breakfast. Samples were taken twice a week from the four subjects on the depletion diet and once a week from the control subject. When supplements were being given, the blood was taken at least twenty hours after the supplement had been administered.

Each of the four subjects was tested daily on the biophotometer during the first seventy-two days of the study and at frequent intervals thereafter. The control subject was also given frequent biophotometer tests throughout the study.

Determination of Carotene and Vitamin A.—The method used for determining the vitamin A and carotenoids in the blood was that described by Clausen and McCoord.[4] The essentials of the method are as follows:

Three cc. of serum or plasma is used for a determination. The proteins of the serum are precipitated by 95 per cent alcohol, which has been shown to help in releasing the vitamin A so that it can be more easily extracted. Three cc. of petroleum ether is used for extracting the vitamin A and the carotenoids. One cc. of this petroleum ether extract is used for the determination of the carotenoids and a second one for vitamin A.

In determining the carotenoids the petroleum ether is evaporated and equal portions of two immiscible solvents hexane and diacetone alcohol are added. The carotenoids present are thus separated into a "xanthophyll" and a "carotene" fraction because of their difference in solubility in these two solvents. The amount of carotenoid in each fraction is determined colorimetrically against a 0.02 per cent potassium dichromate standard and the results are expressed as gamma of "carotene" and gamma of "xanthophyll" per hundred cubic centimeters of serum.

The vitamin A is determined by a modification of the Carr-Price antimony trichloride method. The blue color is read in a colorimeter against a 10 per cent copper sulfate standard. The blue units obtained are corrected for the carotene and xanthophyll present and are expressed as blue units [5] of vitamin A per hundred cubic centimeters of serum.

It is recognized that small amounts of other carotenoids are probably in both the "carotene" and "xanthophyll" fractions and that the blue color produced with antimony trichloride is not due to vitamin A alone. The limitations of the method are discussed in publications from the Rochester laboratory and so will not be reviewed here.[6] Suffice it to say that the major portion of the color in each instance is due to the substances under consideration; namely, carotene and vitamin A. Furthermore, the errors in the method are minimized in a study of this type, which consists chiefly of repeated determinations of the blood values of subjects on a constant diet, the only variable being an increase or decrease in the vitamin A supplement. No serious misinterpretations of the data should be involved if the values are treated not as absolute but as relative ones and if small changes are regarded as insignificant.

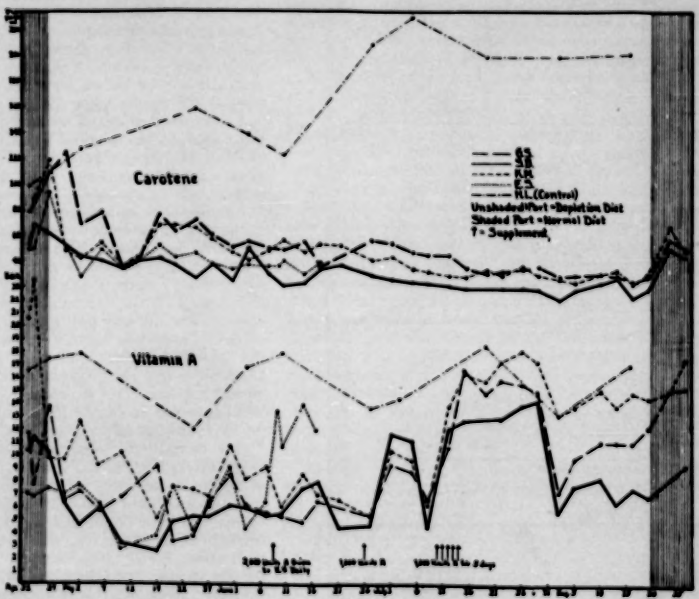

Chart 1.—The amount of carotene and vitamin A in each sample of blood from each subject.

2. The supplement was given as U. S. P. reference cod liver oil.

3. It was necessary for E. S. to leave the city; hence the shorter length of time on the study.

4. Clausen, S. W., and McCoord, A. B.: The Determination of Carotene and Xanthophyll by a Single Distribution Between Liquid Phases, J. Biol. Chem. 112: 89-104 (Feb.) 1936. Clausen and McCoord,[1] McCoord and Luce-Clausen.[1]

5. The values reported for both carotene and vitamin A will be given as the amounts in 100 cc. of serum.

6. Clausen and McCoord (footnotes 1 and 4)

RESULTS

Vitamin A and Carotene in the Blood.—As previously stated, samples of blood were taken from the four experimental subjects twice a week and from the control subject once a week throughout the study, thus making a total of thirty-six determinations for three subjects, twelve for the fourth and eleven for the control. The results of the determinations of both vitamin A and carotene are shown in chart 1.

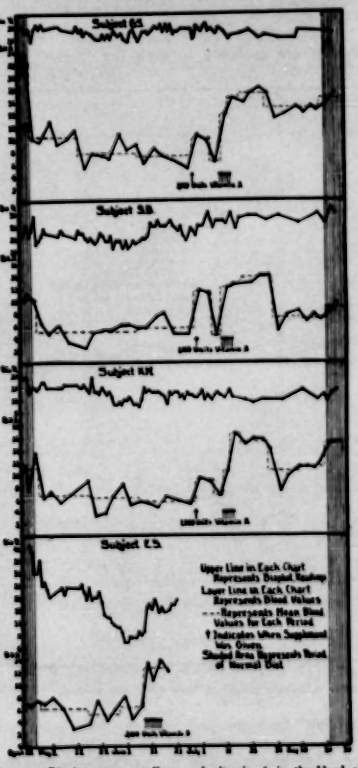
Subject GS
Subject SB
Subject KK
Subject ES
Upper Line in Each Chart Represents Blood Readings
Lower Line in Each Chart Represents Blood Values
---Represents Mean Blood Values for Each Period
† Indicates When Supplement Was Given
Shaded Area Represents Blood of Normal Unit

Chart 2.—Biophotometer readings and vitamin A in the blood of each subject during the study.

It will be noted that the average amount of vitamin A in the fasting blood of the subjects at the beginning of the study ranged from 7.1 blue units for the lowest subject (E. S.) to 22.1 blue units for the highest (G. S.), and the carotene ranged from 60 to 85 micrograms per hundred cubic centimeters of serum. The original levels of vitamin A in the blood of these subjects fits in well with their dietary histories, at least as far as the extremes are concerned. Subject G. S., who had a history of large amounts of vitamin A supplement, showed the highest value and subject E. S., whose dietary history was slightly inferior to the others, the lowest. The blood levels of all the subjects were well within the range of values found by Clausen in the blood of children, but three (11.0, 10.5 and 7.1 blue units) tended to be near the lower limit of the range, where he states the majority of his subjects fall; namely, between 10 and 20 blue units. Since, however, these determinations were all made on fasting blood, they might well be expected to be somewhat lower than those reported in the literature on nonfasting blood. It seems only logical to assume that a meal taken several hours before blood was drawn would affect the amount of vitamin A in the blood, since it has been shown that a supplement of vitamin A causes a maximum rise of as much as 900 per cent in four hours.[7] The fact that these subjects were adults while most of Clausen's subjects were children may also account in part for the level of vitamin A and carotene tending to be low. While the subjects had fairly good diets, these diets were probably relatively lower in vitamin A than are those of the modern child. It will be shown later that subject E. S., who showed the lowest value (7.1 blue units), may have had suboptimal stores of vitamin A. In general, then, these data on the original levels of vitamin A in the blood of the subjects were in good agreement with their dietary histories and with values reported in the literature.

Another point of interest in chart 1 is the variability in the determinations of various samples of blood from the same individuals. This tendency for the level of vitamin A in the blood to vary has been mentioned by most workers in the field; its occurrence in a study of this type, in which the subjects were on a practically constant diet and only fasting blood was used, was unexpected. There was slightly greater variation between the amounts of both vitamin A and carotene in the blood from the control than in that from the experimental subjects. This is probably explained by the fact that her intake of vitamin A and carotene varied, while the experimental subjects were on a constant diet.

One of the most important observations in chart 1 is the marked fall in the vitamin A and carotene level of the blood caused by the depletion diet. The greatest decrease was noted in subject G. S., who had the highest original level (from 22.1 to 7.1 blue units), and the smallest in subject E. S., who had the lowest original level (from 7.1 to 5.0 blue units). A tendency is noted for the vitamin A in the blood of all the experimental subjects to approach that of the lowest subject; namely, 6.0 blue units per hundred cubic centimeters of serum. The values for the control subject varied from 11.5 to 18.9 blue units, with a mean of 15.5; but, as would be expected, there was no consistent tendency for them either to increase or to decrease throughout the study.

The effect of a supplement of vitamin A on the amount in the blood may be observed in this chart by noting the sections marked with arrows to designate when the supplement was given. It will be seen that, beginning with the forty-fifth day of the depletion diet, subject E. S. was given 2,000 units of vitamin A a day for seven days, while the other three subjects were given no supplement until the sixty-fifth day and then only a single 1,000 units capsule.[8] The supplement given E. S. caused a rapid rise in her blood level of vitamin A from an average of 6.0 blue units for the depletion period to 12.5 blue units, a value appreciably higher than that found in her blood during the preliminary period (7.1 blue units). The first supplement

7. Chesney and McCoord.[1]

given to the other three experimental subjects was only 1,000 units, but even this small amount caused a decided rise in the vitamin A in the blood of all the subjects. This is of special interest in light of the fact that the supplement was taken twenty-three hours before the blood was drawn. After this one small supplement of vitamin A the amount in the fasting blood fell slowly and by the end of the week had reached its original low level. When the same small supplement of 1,000 units was again given for two days, a greater increase in vitamin A in the blood occurred, and when given for three additional days a still higher level was attained. The amount of vitamin A in the blood of all the subjects was maintained at a high level for two weeks after the supplement was discontinued and then slowly fell.

TABLE 2.—*The Range, Mean and Standard Deviation of the Determinations of the Vitamin A and Carotene in the Blood of Thirty-Four Adults, One Half of Whom Had Received a Supplement of Vitamin A*

Classification of Subjects	Number of Subjects	Micrograms of Carotene per 100 Cc. of Serum: Mean	Standard Deviation	Range	Blue Units of Vitamin A per 100 Cc. of Serum: Mean	Standard Deviation	Range
Subjects who had taken no supplement.....	17	115	31.3	82-210	9.4	2.6	4.8-14.0
Subjects who had taken a supplement.....	17	130	41.9	88-240	15.8	3.0	11.7-20.8

Although the vitamin A low diet was continued for forty-two days after the supplement was stopped, in only one case did the vitamin A in the blood fall to as low a level as that in the first part of the study. In two subjects, S. B. and K. M., the rise in vitamin A in the blood caused by the supplement resulted in a higher level than that observed at the beginning of the study when the subjects were on a normal diet. The fact that the blood level rose so high and fell so slowly after a supplement of only 1,000 units of vitamin A a day is difficult to explain. These subjects, even with the addition of the supplement, were still getting much less vitamin A than during the preliminary period, following which the blood level had fallen rapidly. Furthermore, 1,000 units of vitamin A is less than the suggested minimum requirement for human beings.

The fact that in the ordinary mixed diet the major portion of vitamin A value is furnished by carotene may have some bearing on the problem. The amount of vitamin A per se in the preliminary diet, however, was probably well over 1,000 units, although it is impossible to calculate just how much of the total vitamin A value was in this form as assays of foods are done by the biologic method, which does not differentiate between carotene and vitamin A. The main animal sources of vitamin A in the preliminary diet were dairy products and eggs, both of which may vary greatly in their carotene content as well as total vitamin A value. There is, therefore, the possibility that the preliminary diet may have contained less vitamin A and more carotene than an inspection of it would indicate. The data, however, clearly show that even a small supplement of vitamin A caused an increase in the amount of this substance in the fasting blood of the subjects on a vitamin A low diet and that this increase was maintained for an appreciable length of time. Furthermore, the increase in blood value and the period the increase was maintained were both roughly proportional to the amount of supplement given.

The carotene values of the blood were apparently not affected by the supplement of vitamin A, as they became progressively lower throughout the study until an adequate diet was resumed. What little vitamin A the experimental diet contained was from vegetable sources, so that it is not surprising that the blood always showed a small amount of this pigment. The carotene in the blood of the control subject, however, increased during the study. This may have been due to the fact that the study was carried on during the spring and summer when more fruits and vegetables were in season, or that she unconsciously chose foods higher in carotene because she knew that she was serving as a control for the study.

The amount of vitamin A and carotene in the blood of the thirty-four subjects from whom single samples of blood were obtained are shown in table 2 and chart 3. These subjects consisted of two groups; one half of them had been taking a supplement of vitamin A for three weeks while the other half had no supplement. There was a significant difference in the mean value of vitamin A in the blood of the subjects in the two groups, as is evidenced by the fact that the mean value for those taking the supplement was 15.8 blue units per hundred cubic centimeters of serum and the standard deviation 3.0 blue units, while the mean value for the other group was 9.4 blue units, the standard deviation 2.6 blue units. There was, however, some overlapping in the values for the two groups, as the range for the supplemented group was from 11.7 to 20.8 blue units, that for the unsupplemented group from 4.8 to 14.0 blue units. This is not surprising in view of the fact that the diet histories of some of the subjects in the unsupplemented group showed very generous amounts of vitamin A and carotene.

As might be expected, there was less difference in the mean values and range of values for carotene in the two groups than for vitamin A. It is interesting, however, to note even a small difference in the mean carotene values for the supplemented and unsupplemented group, 130 versus 115 micrograms of carotene, since the supplement taken by the subjects was not carotene but a product containing vitamin A.

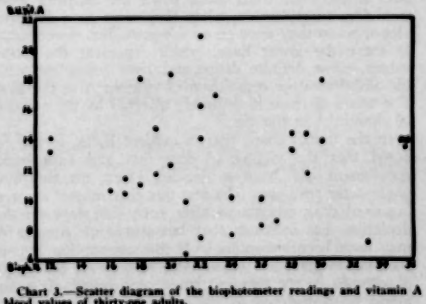

Chart 3.—Scatter diagram of the biophotometer readings and vitamin A blood values of thirty-one adults.

In summary, then, this study, which includes repeated determinations of the amount of vitamin A and carotene

in the fasting blood of subjects on a vitamin A low diet for a period of four months, shows the following:

1. The original level of vitamin A in the blood of the subjects was related to their dietary histories.

2. The blood values of vitamin A fell rapidly when the subjects were placed on a vitamin A low diet, although there was considerable variation noted between individual determinations.

3. Small supplements of vitamin A caused the amount of this substance in the blood to rise rapidly but had no effect on the carotene.

4. The vitamin A blood level reached after a supplement and the length of time that this level was maintained were both affected by the size of the supplement given.

5. The average amount of vitamin A in the fasting blood of subjects receiving a supplement of vitamin A was significantly higher than that of subjects who had no supplement.

Relation Between Vitamin A in the Blood and Biophotometer Readings.—Since it has been claimed that the biophotometer test is an index of a subject's nutritional status as regards vitamin A, it is interesting to compare the trend of the biophotometer readings and vitamin A in the blood of these subjects. The method followed in giving the biophotometer tests was that described by Jeans and his associates.* Only the readings for the first test in the recovery period are reported here, as in every case these readings reflected the general trend of the test as a whole. Chart 2 shows the individual biophotometer readings, in dial spaces, for this point in the test and the amount of vitamin A in the blood of each subject plotted according to time.

Attention is directed first to the upper three charts, those of subjects G. S., S. B. and K. M. It will be noted that there is no relationship between the original biophotometer readings and the amount of vitamin A in the blood, nor is there any tendency for the two to parallel each other as the study progresses. Although the biophotometer tests vary from reading to reading, their general trend is surprisingly uniform. One cannot, in fact, tell from them when the subjects were receiving a supplement, when they were on a deficient diet or when they were on an adequate diet. In contrast to these the lower lines, which represent the blood values, show definite drops and rises coincident with the withdrawal or restoration of vitamin A to the diet. The trend of these is definitely affected by the amount of vitamin A in the diet.

In the fourth chart, that of subject E. S., it will be noted that the vitamin A low diet and subsequent supplement did have a decided effect on the biophotometer readings. The fact that this subject showed impaired dark adaptation after forty-five days on the depletion diet indicates that her stores of vitamin A may have been suboptimal. If this assumption is correct, her original low blood value of only 7.2 blue units of vitamin A per hundred cubic centimeters of serum might be considered as indicative of low stores; her original biophotometer readings, however, were the highest of any of the subjects and would therefore have to be considered of no diagnostic value.

Further comparisons of vitamin A in the blood and biophotometer readings can be made from data from thirty-one of the group of thirty-four subjects studied who were each given two or more biophotometer tests. Chart 3 shows a scatter diagram in which the blood values of vitamin A and the biophotometer readings for these subjects are plotted. It will be noted that the data represented cover a wide range of values but that there is no tendency toward a correlation. It is clearly evident, therefore, that here, as in the case of the four subjects on the depletion diet, there is no relationship between biophotometer readings and the amount of vitamin A in the blood.

In a study reported elsewhere of the reliability and validity of the biophotometer test, of which this study was a part, we have shown that while there is no doubt some relationship between the biophotometer readings and the nutritional status of the subject with respect to vitamin A, the relationship is not close enough to make the test of use as a diagnostic measure. Therefore the lack of relationship between the biophotometer test and the blood values reported here furnishes no evidence as to whether the blood values are related to the vitamin A stores of an individual. It is evident, however, in the case of the five subjects studied most extensively, that the original blood values agree better with the dietary histories of the subjects than do their biophotometer readings and that the fasting blood level responds more quickly to changes in vitamin A intake than do the biophotometer readings.

COMMENT

From this study it is evident that the amount of vitamin A in fasting blood is directly affected by the amount in the diet. It is obvious, moreover, that the fasting blood level must reflect not only the diet of the preceding day but to some extent the habitual level of intake. This is shown by the following: 1. The original blood levels of the four subjects on the depletion study were in the same order as the amount of vitamin A they were in the habit of eating, as judged by their dietary histories, even though they had been on similar diets for a week previous to the time the blood was drawn. 2. The depletion diet caused a decrease in the amount of vitamin A in the blood of all the subjects, but an appreciable period of time elapsed before their blood values reached the same low level. 3. The subject with the lowest original blood value was the only one of the four for whom there was any evidence of impaired dark adaptation on the depletion diet. 4. A small supplement of vitamin A added to the depletion diet caused an immediate rise in the amount found in the fasting blood, but the withdrawal of the supplement did not cause an immediate fall. 5. The blood from the seventeen subjects who had been receiving a vitamin A supplement contained more vitamin A than that from the unsupplemented subjects. This interpretation of the blood values is also supported by the evidence from the literature, namely, that higher blood values were obtained in subjects from a high than from a low socioeconomic status, and subjects showing clinical symptoms of vitamin A deficiency as a rule had very low blood values.

The acceptance of this contention that the vitamin A in fasting blood is partially dependent on the amount eaten the previous day and partially on the past diet does not, however, answer the crucial question of whether or not blood studies can be used as a measure of nutritional status in respect to this vitamin. Several observations made in the present study make it clear that the blood level at any given time does not necessarily reflect the body's stores. This is illustrated in

8. Jeans, P. C.; Blanchard, Evelyn, and Zentmire, Zelma: Dark Adaptation and Vitamin A, J. A. M. A. **108**: 451-458 (Feb. 6) 1937.

the case of G. S. For several months preceding the study she had been supplementing an already adequate diet with large amounts of vitamin A concentrates and her stores should theoretically have been filled. Nevertheless, when placed on the depletion diet, her blood level fell rapidly and at the end of two months was approximately the same as that of the other subjects. Thus her blood level at this point in the study would have indicated that her stores were no better than theirs, while actually they should have been far better.

The same lack of relation between blood level and theoretical vitamin A stores is shown by the response to the supplement. Following a total addition of only 6,000 units of vitamin A, or little more than a normal day's intake, the amount in the blood of three of the subjects rose above the original level and remained there for several days in spite of the fact that the subjects had been on a vitamin A deficient diet for from forty-five to sixty-five days, and their stores should presumably have been at least partially depleted.

Even though the blood levels of vitamin A cannot be relied on to reflect the stores when abrupt changes are made in the dietary, nevertheless the data from this study and those in the literature would indicate that the blood level for vitamin A of subjects on their usual diet, if observed over a reasonable period, might give some indication of the subject's reserves of this vitamin. It appears obvious that if fairly large amounts of vitamin A are consistently found in the blood of a subject (e. g., 16 blue units or more) there is little doubt that his diet, and consequently his stores, contain generous amounts. Conversely, if low amounts are consistently found (e. g., less than 6 blue units) it would probably indicate that the body stores of the vitamin were in the process of being depleted. The determination of the vitamin A in a single sample of even fasting blood from any one individual would have little significance in either case, as it might easily be affected by the intake of the previous day and might not be truly representative of the diet as a whole.

If the biophotometer had proved to be a more sensitive and reliable means of determining mild vitamin A deficiency, the data presented would have been easier to interpret. In that case one would have expected to find a positive relationship between the biophotometer readings and the blood studies, provided of course that they both were related to the nutritional status of the subjects. Since, however, the biophotometer was shown to be of little use except in the case of quite marked dysadaptation, it was of no help in this problem.

While the data presented help to clarify several of the problems involved in the interpretation of levels of vitamin A in the blood, further research is necessary before their significance in relation to nutritional status can be fully understood.

SUMMARY

Semiweekly determinations were made of the amount of vitamin A and carotene in the blood of four experimental and one control subject during a four months depletion study. The conclusions from these data were supported by those from single determinations of these constituents in the blood of thirty-four adults, one half of whom had received a supplement of vitamin A. Biophotometer readings were made of the subjects during the depletion diet and of thirty-one of the other subjects.

The results of the study show that the amount of vitamin A in the fasting blood is dependent on the amount in the diet. While the evidence as to whether or not determinations of the vitamin A in the blood are of value in judging nutritional status is contradictory, the data show that consistently low fasting blood values indicate that probably the body stores of vitamin A are being depleted and very high values that the intake of vitamin A is adequate. The results further show that there is no correlation between the amount of vitamin A in the blood and the biophotometer readings.

HYPERPARATHYROIDISM AND PREGNANCY

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The concept of disease caused by increased function of parathyroid tissue has been firmly established since Mandl's[1] successful removal of a parathyroid adenoma for osteitis fibrosa cystica in 1925. During the past thirteen years, more than 150 well studied cases of hyperparathyroidism have been reported and much has been added to our knowledge of the disease. However, a review of the literature revealed only one report dealing with pregnancy in a patient with hyperparathyroidism.[2] It is our purpose in this communication to record such a case and to discuss the interesting problem that it presents.

REPORT OF CASE

History.—A woman aged 29, an American-born dancer, was admitted to Mount Sinai Hospital with chronic hyperparathyroidism on Sept. 19, 1938, in the fourth month of her first pregnancy. Her family history was negative. She was a seven months infant weighing 5 pounds (2,268 Gm.) at birth. Her early history was uneventful.

Her past history is a good example of the course of chronic hyperparathyroidism.[3] She enjoyed good health until she was 19 (1928), when attacks of renal colic caused her to enter another hospital, where two calculi were removed from the right ureter. Two years later (1930) a cherry-sized mass, which had appeared during the preceding three months, was excised from the left maxilla. This was a giant cell tumor. Shortly afterward she passed a left ureteral calculus without operative intervention.

In 1931 she fractured the right humerus. X-ray films showed a bone cyst involving the head and neck of the humerus in addition to a fracture of the surgical neck. The rest of the skeleton was normal. In 1935, on her sixth admission to the same hospital, she presented a painless swelling of the left lower jaw. Except for occasional vague pains in the extremities she had been perfectly well and continued an active life as a dancer. Roentgenograms of the entire skeleton now revealed generalized osteitis fibrosa cystica. The blood calcium was high, the inorganic phosphorus low and the serum phosphatase elevated. These observations led to a thorough but unsuccessful exploration of the patient's neck for a parathyroid adenoma. The bone cyst in the left mandible was excised for cosmetic reasons. This resulted in a sizable defect, which was filled with a bone graft in June 1938. Pathologic examination of a piece of rib removed for the graft showed osteitis fibrosa cystica.

From the Gynecological Service of Dr. Samuel H. Geist and the Division of Laboratories of the Mount Sinai Hospital.

1. Mandl, Felix: Therapeutischer Versuch bei einem Falle von Ostitis fibrosa generalisata mittels Exstirpation eines Epithelkörperchentumors, Zentralbl. f. Chir. **52**: 260-264 (Jan. 30) 1926.

2. Bevere, L., and Sorrentino, B.: Contributio allo studio dell'osteite fibrocystica generalizzata, Riforma med. **48**: 313-318 (Feb. 27) 1932.

3. The details of the past history were made available to us by Dr. William F. MacFee.

In June 1938 the patient became pregnant. Previously her menstrual periods had always been regular and normal in every respect. She continued to feel well until the onset of nausea and vomiting during the third month. At this time she began to have an aching pain in both heels. She consulted a physician, who sent her to the Mount Sinai Hospital to have the proper management of her pregnancy determined.

Examination.—On admission the patient was thin and appeared chronically ill. There were no gross deformities. The hair was thin and silky. The nails were brittle and ridged. The skin was clear and of normal texture. There were many well healed operative scars. The lower incisors were very loose. Several teeth were missing. The blood pressure was 110 systolic, 70 diastolic. The only other abnormalities were those of early pregnancy. The vaginal mucosa was cyanotic, the cervix was soft and nulliparous and the mobile uterus was enlarged to about 3½ months. Hegar's sign was positive.

Examination of the blood revealed hemoglobin 72 per cent, red blood cells 4,200,000, white blood cells 9,800, polymorphonuclear leukocytes 70 per cent, lymphocytes 26 per cent, monocytes 4 per cent. The urine was neutral to acid and cloudy, contained albumin, clumps of white blood cells, rare red blood cells and granular calcium phosphate casts [4] on repeated examinations, had a specific gravity which varied from 1.012 to 1.024, and a concentration test (Fishberg) showed a maximum concentrating power of 1.024. A phenolsulfonphthalein test (following hysterotomy) showed 75 per cent excretion of the dye in two hours.

Results of the chemical analysis of the blood are given in the accompanying table.

Results of Chemical Analysis of the Blood

	During Pregnancy		After Hysterotomy
	9/22/38	9/26/38	10/10/38
Urea nitrogen per 100 cc.	8 mg.	7 mg.	.....
Sugar per 100 cc.	75 mg.	.....	.....
Calcium per 100 cc.	11 mg.	11.9 mg.	14.4 mg.
Phosphorus per 100 cc.	2.4 mg.	2.6 mg.	2.7 mg.
Phosphatase	90 King-Armstrong units	.....	64.5 King-Armstrong units
Total protein per 100 cc.	5.1 Gm.	5.2 Gm.	5.0 Gm.

The following hormone assays were reported (courtesy of Dr. Robert T. Frank): Normal pregnancy test: six day specimen of urine (from September 22 to 27) showed a three day estrogen output of $\frac{6{,}000 \text{ international units combined}}{1{,}250 \text{ international units free}}$; second specimen for a three day period $\frac{11{,}750 \text{ international units combined}}{3{,}000 \text{ international units free}}$; blood estrogen 100 international units per liter; urine gonadotropic (III) reaction 2,000 rat units per liter; blood gonadotropic (III) reaction 3,000 rat units per liter.

The Hamilton-Highman test [5] for abnormal amounts of parathyroid extract in the blood gave negative results.

Metabolic Data: On a neutral ash diet, containing approximately 100 mg. of calcium daily, the patient had a urinary excretion of 1,293 mg. of calcium for a three day period, an average of 431 mg. daily (normal, from 80 to 100 mg. per day).[6] After abdominal hysterotomy the urinary calcium increased slightly to 465 mg. daily on the same diet. To simplify the balance studies the calcium in the stool was not determined, since in hyperparathyroidism without renal insufficiency only urinary excretion of calcium is excessive.[7]

Roentgenograms: The long bones showed diffuse decalcification. Both humeral heads were cystic (fig. 1). There were similar but less well defined changes in both tibias. The pelvis showed large lacunar areas in the innominate bones. There was a generalized decalcification of the pelvic bones with a coarsening of the trabecular structure (fig. 2). The lower ribs showed similar changes.

The skull showed a diffuse thickening of the bones of the calvarium, especially at the outer table. The bones of the skull had an irregular mottled appearance simulating the so-called cotton-wool picture (fig. 3). The mandibles showed cystic areas on both sides. There was a cyst in a recent bone graft.

A flat plate of the abdomen showed three small concretions, which may be renal calculi, within the contour of the left kidney. The kidneys were normal in size, shape and position. X-ray films of the chest showed no abnormality in the lungs. There was no mediastinal tumor.

Course.—During her stay in the hospital, the patient was symptom free and tolerated the test diets well. She lost about 1 pound (450 Gm.) during the first balance study. Eight days after admission, abdominal hysterotomy was performed for reasons discussed later. The patient was delivered of a well formed fourteen weeks fetus. The postoperative course was uneventful. The patient was afebrile except for a slight postoperative temperature rise to from 101 to 102 F. for two or three days. She was discharged three and one-half weeks after admission.

THE FETUS

The specimen was a well formed fetus measuring 15 cm. from crown to heel. The weight was 78 Gm. X-ray films showed normal osseous development for a twelve to sixteen week fetus.[8] There was no evidence of metastatic calcification.

The bones were examined microscopically, with material fixed in solution of formaldehyde or in Zenker's fluid and stained with von Kossa solution or hematoxylin and eosin. Sections through the humerus revealed straight thin primary zones of calcification (cartilage-shaft junction) with an orderly arrangement of thin calcified cartilage cores covered with bone on the shaft side. The subepiphysial zone was vascular and contained a fair number of osteoclasts. The diaphysis was well developed and was composed of anastomosing trabeculae separated by spaces containing blood-forming marrow. Everywhere trabeculae were covered by osteoblasts. The osteogenic layer of the periosteum consisted of an unbroken line of osteoblasts. There was no evidence of marrow fibrosis or excessive osteoclastic activity. Osteoblastic function seemed normal. Sections stained for calcium (without decalcification) showed no impairment of calcium deposition in formed bones. Sections of the radius, ulna, tibia and metacarpal revealed similar changes. The impression was that of normal developing bone.

The parathyroids were identified on serial sections of the organs of the neck. Three glands lay posteromediad to the thyroid and one within the substance of the thyroid. Each was a round compact structure composed of closely packed cells with clear, unstained cytoplasm and round vesicular nuclei. There was a slight tendency to form alveoli. The glands showed no evidence of fibrosis or hemorrhage. The impression was that of normal developing parathyroid tissue.[9]

COMMENT

This case satisfies the clinical and metabolic criteria of hyperparathyroidism discussed at length in many reviews.[10] The onset with renal calculi, the gradual appearance of osteitis fibrosa cystica, the demonstra-

4. Albright, Fuller, and Bloomberg, Esther: Hyperparathyroidism and Renal Disease with Note as to Formation of Calcium Casts, J. Urol. **34**: 1 (July) 1935.

5. Hamilton, Bengt, and Highman, W. J., Jr.: Test for Abnormally Large Amounts of Parathyroid Hormone in Blood, J. Clin. Investigation **15**: 99-100 (Jan.) 1936.

6. Bauer, Walter, and Aub, J. C.: Studies in Inorganic Salt Metabolism, J. Am. Dietet. A. **3**: 106-115 (Sept.) 1927. Bauer, Walter; Albright, Fuller, and Aub, J. C.: Studies on Calcium and Phosphorus Metabolism; The Calcium Excretion of Normal Individuals on a Low Calcium Diet Including Data on a Case of Pregnancy, J. Clin. Investigation, **7**: 75-96 (April) 1929.

7. Jaffe, H. L.: Hyperparathyroidism, Arch. Path. **16**: 63 (July), 236 (Aug.) 1933.

8. Hess, J. H.: The Diagnosis of the Age of the Fetus by the Use of Roentgenograms, Am. J. Dis. Child. **14**: 397-423 (Dec.) 1917.

9. Gilmour, J. R.: Embryology of Parathyroids, Thymus and Certain Associated Rudiments, J. Path. & Bact. **45**: 507-522 (Nov.) 1937.

10. Hunter, D. H., and Turnbull, H. M.: Hyperparathyroidism, Brit. J. Surg. **25**: 203-284 (Oct.) 1931. Wilder, R. M., and Howell, L. P.: Etiology and Diagnosis of Hyperparathyroidism, J. A. M. A. **106**: 427-431 (Feb. 6) 1936. Barr, D. P., and Bulger, H. A.: The Clinical Syndrome of Hyperparathyroidism, Am. J. M. Sc. **179**: 449-470 (April) 1930. Gutman, A. B., Swenson, P. C., and Parsons, W. B.: Differential Diagnosis of Hyperparathyroidism, J. A. M. A. **102**: 87-94 (July 14) 1934. Shelling, D. H.: The Parathyroids in Health and Disease, St. Louis, C. V. Mosby Company, 1935. Albright, Fuller; Aub, J. C., and Bauer, Walter: Hyperparathyroidism, J. A. M. A. **102**: 1276-1287 (April 21) 1934. Jaffe.[7]

tion of an excessive urinary excretion of calcium as well as hypercalcemia, hypophosphatemia and elevated serum phosphatase afford ample proof of increased parathyroid activity. The failure to find abnormal parathyroid tissue at operation is not unusual, considering the variability in the number and location of the human parathyroids.[11] "A positive diagnosis is a challenge to the skill and patience of the surgeon, and when these have been exhausted in a fruitless search for an adenoma, the operator is privileged to say 'the tumor cannot be found' but not 'the tumor does not exist.'" [12]

The decision to terminate this pregnancy was determined largely by the presence of extensive fibrocystic disease of the maternal skeleton associated with a negative calcium balance. This indication of moderately severe hyperparathyroidism led to the conclusion that it would harm our patient if she continued to bear the added metabolic burden of gravidity. We regret that we were unable to extend the period of observation to study the combined effect of increasing fetal mineral requirements and excessive maternal parathyroid function on the course and outcome of pregnancy.

The continuance of pregnancy with the patient in positive calcium balance was believed inadvisable in view of the tendency for diets rich in calcium, phosphorus and vitamin D to accelerate the development of serious renal complications of hyperparathyroidism.[13] Likewise, reexploration for a parathyroid tumor during pregnancy was not attempted because it was felt that, even if the offending agent was found, its removal would endanger both mother and fetus by precipitating severe tetany.[14] Thus a brief consideration of the possible effects of coexisting hyperparathyroidism and pregnancy will serve to justify abortion as the logical therapeutic measure.

An essential feature of hyperparathyroidism is the excessive excretion of calcium and phosphorus. The loss of calcium occurs chiefly in the urine, except in a few instances in which marked renal insufficiency increases the fetal calcium. The steady loss is associated with a reduction of the mineral content of the skeleton and the development of bone changes. These vary from mild osteoporosis, difficult to detect by roentgenograms, to severe osteitis fibrosa cystica, depending probably on the duration and intensity of the abnormal endocrine stimulus. In advanced cases the normal rigidity of the skeleton is lost. Fractures and deformities are common and may produce marked disability.

The steady depletion of her mineral stores limits the capacity of the pregnant woman with hyperparathyroidism to deal successfully with the fetal demand for calcium and phosphorus. This demand is of considerable magnitude, since the average term fetus contains about 25 Gm. of calcium.[15] It has been estimated that there is a steady rise in the fetal absorption of calcium from 50 mg. a day at three months to 450 mg. a day during the tenth lunar month.[16] During normal pregnancy, provided the diet is adequate, maternal retention of calcium exceeds the daily fetal requirements, except at the tenth month, when the fetal need is almost double the average maternal retention and calcium must be withdrawn from the maternal reserves.[16] In many instances, possibly as a result of inadequate intake or defects in calcium metabolism, the maternal tissues are called on to supplement the dietary supply of minerals still further, as shown by the not uncommon appearance of clinical phenomena during pregnancy referable to the drain of calcium from the mother.[17] Osteomalacia is a good example of the effect of extreme deprivation of calcium and phosphorus on the course of pregnancy.[18] This disease, characterized by softening and deformity of the bones, is common during pregnancy and lactation among populations whose diets are deficient in calcium, phosphorus and vitamin D. Under these circumstances the skeleton of the pregnant woman is demineralized by the intra-uterine parasite, which is often stillborn with evidence of fetal rickets.[19]

The case of Bevere and Sorrentino [2] illustrates the effect of repeated pregnancies on a woman with hyperparathyroidism:

> A woman aged 32 began to suffer from stabbing pains in both feet during the eighth month of her tenth gravidity. This pregnancy terminated successfully. During her eleventh pregnancy, one year later, there was an exacerbation of these pains, which spread to the thighs and upper extremities. She could not walk or sit down without severe pains. At term she gave birth to a dead fetus. During the subsequent months she felt very weak and lethargic. Clubbing of the fingers appeared. She again became gravid within a year. From the onset she could not move without severe pain and was completely bedridden. During the seventh month she fractured the left humerus while turning in bed. During the eighth month she sustained fractures of the right humerus, femur and clavicle, with the production of marked deformities. X-ray examination during the eighth month showed marked decalcification of the bones, which contained many large loculated cysts. The blood calcium was from 13.8 to 14.6 mg. per hundred cubic centimeters; inorganic phosphorus was from 2.9 to 3.1 mg. A negative calcium balance amounting to 400 mg. a day was demonstrated. The patient refused operation for removal of parathyroid tissue and gave birth to a normal baby girl whose bones showed no abnormalities on x-ray examination. Despite a resemblance to osteomalacia, this case was apparently one of hyperparathyroidism in view of the results of the x-ray and chemical examinations.

From the preceding data it is reasonable to conclude that pregnancy increases the damage to a skeleton whose mineral reserves have been depleted and whose ability to retain bone-forming materials is impaired by excessive parathyroid activity.

That pregnancy may be an etiologic factor in some cases of hyperparathyroidism is an interesting possibility suggested by the case of Bevere and Sorrentino. Similarly, in the following reports, pregnancy seemed to be associated either with the onset or with an increase in the severity of unrecognized chronic hyperparathyroidism:

> CASE 1.[20]—A married woman aged 49, with bilateral renal calculi and generalized osteitis fibrosa cystica, was seen in 1929, ten years after she had begun to suffer from polyuria and polydipsia. She had one miscarriage at three months in 1918 and gave birth to a stillborn child just before the first symptoms of her illness in 1919. There were five other children living and well. A parathyroid adenoma was removed.

11. Gilmour, J. R.: Gross Anatomy of the Parathyroids, J. Path. & Bact. **46**: 133-149 (Jan.) 1938.
12. Churchill, E. D., and Cope, Oliver: The Surgical Treatment of Hyperparathyroidism, Ann. Surg. **104**: 9-35 (July) 1936.
13. Johnson, J. L.: Experimental Chronic Hyperparathyroidism, Am. J. M. Sc. **183**: 769-783 (June) 1932. Churchill and Cope.[12]
14. Hartley, E. C.: The Tetanoid Syndrome in Obstetrics, Am. J. Obst. & Gynec. **19**: 54-63 (Jan.) 1930. Churchill and Cope.[12]
15. Givens, M. H., and Macy, Icie G.: Chemical Composition of Human Fetus, J. Biol. Chem. **102**: 7-17 (Sept.) 1933. Ish, Vivian, and Swanson, W. W.: Mineral Growth of Human Fetus, Am. J. Dis. Child. **47**: 302-306 (Feb.) 1934.
16. Macy, Icie G., and Hunscher, Helen: An Evaluation of Maternal Nitrogen and Mineral Needs During Embryonic and Infant Development, Am. J. Obst. & Gynec. **27**: 878-888 (June) 1934.
17. Coons, Callie Mae, and Blunt, Katherine: Retention of Nitrogen, Calcium, Phosphorus and Magnesium by Pregnant Women, J. Biol. Chem. **86**: 1-13 (March) 1930. Hartley.[14]
18. Maxwell, J. P., and Turnbull, H. M.: Two Cases of Fetal Rickets, J. Path. & Bact. **33**: 327-338 (April) 1930.
19. Maxwell, J. P.; Hu, C. H., and Turnbull, H. M.: Fetal Rickets, J. Path. & Bact. **35**: 419-440 (May) 1932.
20. Hunter and Turnbull.[20]

CASE 2.[21]—A woman aged 42 was seized with severe abdominal pain radiating to the back during the sixth month of her ninth gravidity. This was followed by a spontaneous abortion (stillbirth). During the next two years she gradually diminished in height and suffered from pain in both legs and difficulty in locomotion. A diagnosis of hyperparathyroidism was made then and a parathyroid adenoma was removed from behind the left pole of the thyroid.

CASE 3.[22]—A woman aged 36 began to have attacks of renal colic during her fourth and last pregnancy. For the next four years she suffered from recurrent renal colic. Studies showed renal stones, blood changes suggestive of hyperparathyroidism and a negative calcium balance. A chief cell adenoma was removed from behind the right lobe of the thyroid. The patient made an uneventful recovery.

CASE 4.[23]—A woman aged 23 was studied because her 5 months suckling infant suffered from severe tetany refractory to treatment. Except for vague tiredness during the previous few years, she was asymptomatic. Her blood calcium was found to be 16.4 mg. per hundred cubic centimeters, phosphorus 2.5 mg., phosphatase elevated and urinary calcium increased. X-ray examination showed granular calcium deposits in both kidneys; there was a small cyst in the left pelvic bone and another in the right femur. A parathyroid adenoma was removed.

CASE 5.[24]—A multipara aged 40 gave a history of onset of severe epigastric pain for the first time during her first pregnancy at the age of 30. This recurred two years later during her second pregnancy. Both pregnancies terminated successfully. During the next three years she suffered from epigastric pain radiating to the back. This led to an examination which disclosed a compression of the eleventh dorsal vertebra and the metabolic manifestations of hyperparathyroidism. Operation for removal of parathyroid adenoma was unsuccessful. Biopsy was positive for osteitis fibrosa cystica. Since operation the patient has lost weight, suffers from intractable pain and has decreased several inches in height.

Several points support the suggestive case material and perhaps indicate a mechanism to explain the possible relationship between pregnancy and hyperparathyroidism. The disease is three times more common in women, in whom it occurs with greatest frequency after the age of 40.[25] We are unaware of a satisfactory explanation of this sex incidence. It is likely that many cases of hyperparathyroidism go unrecognized for many years, since the diagnosis is often obscure in early and mild cases.[26] Such cases afford ample opportunity for aggravating factors to exert their effects. Finally there is some evidence for a physiologic increase in parathyroid activity in response to the demands of normal gestation. Hyperplasia and increased vascularity of the parathyroids during pregnancy have been observed.[27] Moreover, several workers state that they have demonstrated abnormally large amounts of parathyroid extract in the blood of pregnant women during the last trimester.[28] It has been suggested that this increase in parathyroid function occurs to counteract the tendency for the blood calcium to fall during the last months of pregnancy by liberating calcium from bone trabeculae or other sites of recent calcium deposit.[29]

Parathyroid hyperplasia is encountered in a variety of conditions. Enlargement of the glands has been observed in rickets,[30] osteomalacia,[31] renal dwarfism,[32] chronic nephritis [33] and metastatic carcinomatosis of the skeleton.[34] Hyperplasia of the glands has been produced in rats by partial ablation of renal tissue.[35] In most of these states there is some evidence of increased parathyroid function. Excessive amounts of parathyroid extract have been detected in the blood in cases of rickets [36] and of chronic nephritis [37] and in a case of renal dwarfism.[32] In each of these instances the parathyroid hyperplasia is probably compensatory to furnish increased amounts of hormone in response to calcium deficiency or hyperphosphatemia.

There are a few indications that compensatory hyperplasia occasionally gives rise to phenomena attributable to chronic hyperparathyroidism. In some cases of long standing renal insufficiency with secondary parathyroid hyperplasia a disease picture is encountered which is difficult to distinguish from primary hyperparathyroidism with renal complications.[38] An increase in the calcium content of the residual renal tissue of partially nephrectomized rats has been cited as evidence that the parathyroid hyperplasia produced by this procedure acts in a manner similar to excessive amounts of parathyroid extract.[39] Moreover, a tendency toward the formation of localized, apparently semiautonomous centers of excessive growth has been noted in the hyperplastic parathyroids of patients with chronic nephritis.[40]

It is interesting that the diffuse parathyroid hyperplasia of rickets has been held responsible for the "relatively high incidence of hyperfunctioning parathyroid adenomas in England and New England, where the likelihood of vitamin D deficiency is favored by the indoor life of the industrial population." [25] According to this theory the presence of cell rests in the hyperplastic glands of rachitic patients forms the anatomic basis of the formation of adenoma. While this concept may explain the regional distribution of the disease, it throws little light on the question of sex incidence. In view of suggestive clinical evidence and certain disease-producing potentialities of parathyroid hyperplasia it is conceivable that pregnancy, with the introduction of factors enhancing parathyroid activity, may lead to permanent changes in the glands which precipitate and increase the severity of chronic hyperparathyroidism.

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25. Wilder and Howell.[19]

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31. Molineus: Ueber die multiplen braunen Tumoren bei Osteomalacie, Arch. f. klin. Chir. **101**: 333-346, 1913.

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The effect of hyperparathyroidism on the development of the fetus is worthy of careful study, since there are little accurate data on this point. Theoretically, two influences could produce fetal abnormality: (1) alterations in the availability of calcium and phosphorus for the formation of bone and (2) the direct action of the maternal parathyroid hormone on the embryonic tissues. Insufficient calcium and phosphorus, because of a mineral deficiency in the mother, would tend to impair the calcification of the fetal bones, producing a condition like fetal rickets in osteomalacia.[39] On the other hand, should the fetus be capable of diverting the maternal mineral stream from the path of excretion characteristic of hyperparathyroidism, the increased availability of bone-forming minerals might lead to excessive calcification of the developing bones. It is interesting that premature calcification of bone nuclei was detected in a 5 months old infant whose mother was found to be suffering from symptomless chronic hyperparathyroidism.[23] Moreover, hypercalcemia was noted in the mother of an infant with osteopetrosis (marble bones),[41] while osteosclerosis has been observed in fetuses whose mothers received excessive amounts of calcium, phosphorus and vitamin D during gestation.[42] Whether abnormal activity of the maternal parathyroids is capable of affecting the fetus directly is unsettled. Some evidence suggests that the placenta is impermeable to parathyroid extract and that the fetus possesses considerable tolerance to a few large doses of this substance.[43] However, the occurrence of refractory infantile tetany in the case of Friderichsen suggested an inhibitory influence of excessive maternal parathyroid secretion on the functional development of the fetal parathyroid apparatus.[23] This possibility is compatible with the finding that newborn infants not infrequently show signs of parathyroid deficiency.[44] The production of bone disease in young animals by repeated injections of parathyroid extract shows that age alone offers slight protection against the pathologic effects of an excess of this substance in susceptible species.[45]

Fig. 1.—Cystic area in head of right humerus.

In our case the failure to detect changes in the fourteen weeks fetus is inconclusive owing to the small fetal mineral requirements at this age and to the short period of contact with the abnormal endocrine stimulus. The successful termination of pregnancy in the case of Bevere and Sorrentino [2] is a remarkable demonstration of parasitic embryonic growth and lends support to the idea that the placenta is impermeable to parathyroid extract. However, the outcome of the previous pregnancy, as well as the occurrence of fetal death in two of the cases previously cited, in which pregnancy and unrecognized hyperparathyroidism seem to have coexisted, is perhaps indicative of a significant infant mortality.

Fig. 2.—Appearance of pelvis, showing large cysts, decalcification and exaggeration of trabecular structure.

SUMMARY

In a case of chronic hyperparathyroidism complicated by pregnancy, the pregnancy was terminated because it was felt that these states would affect one another adversely with unfavorable results for mother and fetus. In view of the evidence for increased parathyroid function during pregnancy, the possibility is suggested that pregnancy may precipitate or aggravate hyperparathyroidism in some cases, thus accounting for the increased incidence of the disease in the female.

Fig. 3.—Lateral view of skull, showing mottled appearance of bones with thickening of calvarium.

Fifth Avenue and One Hundredth Street.

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BRONCHIOGENIC CARCINOMA

A DIAGNOSTIC ENIGMA

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The recent voluminous literature on bronchiogenic carcinoma calls for justification in the presentation of a small group of cases. It may be said, however, that the capacity for early recognition of this disease has not kept pace with the increasing realization of its importance as a common condition. The trend of opinion about pathologic entities, in the present scheme of things, is a curious mixture of diverging views, few of which are not empirical. The importance of certain phases of problems depends on the frequency of reiteration from authoritative sources. It is unfortunate that we do not live in a medical utopia where some central registering agency, demanding uniformity of data, could have available the totality of facts on proved cases of any one condition. Things being as they are, however, we wish to emphasize the pathologic, clinical and roentgenologic nonconformity of bronchiogenic carcinoma, and we base our paper on twenty-three cases. The role this form of malignant process plays in simulating other conditions, its role as an imitator, is perhaps its most characteristic feature. Like the devil, it can appear in any shape or form.

INCIDENCE

The early history is traced to Morgagni (1761), whom Adler [1] recognized as the first to identify primary cancer of the lung. Barron [2] stated that Boyle (1810) described phthisie cancereuse as one of his six varieties of phthisis. Adler,[1] who in 1912 compiled 374 cases, was probably the first to dispel the belief in the rarity of primary carcinoma of the lung.

Graham,[3] Edwards,[4] Christie [5] and Jaffé [6] placed the incidence of bronchiogenic carcinoma somewhere between 5 and 10 per cent in relation to all carcinoma. At the University of Toronto for the ten year period ended 1936 the lungs and bronchi proved the third commonest site for malignant epithelial tumors as seen at autopsy.[7]

Whether the increased incidence is apparent or real remains unsettled. Klotz [7] stated that the strongest argument for belief in a real increase is to be found in reports coming from institutions which have been under the same supervision and have required the same standards of diagnosis for a number of years and that "an increase under such conditions has been reported by Rosahn, Weller, Barron, Klotz, Simpson, Duguid, Hunt, and many others, and forms in part their belief in the reality of the increase." More recently Olson,[8] Matz [9] and Barnard [10] supported the belief in the absolute increase in incidence. According to the statistical data at the Institute of Pathologic Anatomy,[11] a real increase in the frequency of cancer of the lung has been determined. Fried,[12] on the other hand, took the opposite view and subscribed to the belief that the increase is apparent rather than real, citing among other reasons increased availability of hospitalization and revolutionary improvement in diagnostic methods as applied to the chest, enabling clinician and pathologist to discover lesions which had been overlooked before.

Klotz [7] mentioned that the dictum of Virchow with reference to the rarity of primary tumors in organs which are the site of metastasis may have been a traditional barrier to a diagnosis of carcinoma of the lung. He also mentioned the ability to recognize lesions once thought metastatic, sarcomatous or inflammatory.

ETIOLOGY

The etiologic factors in bronchiogenic carcinoma, as in carcinoma elsewhere, remain obscure. Chronic inflammatory processes, inhalation of irritating substances and hereditary susceptibility are all invoked because of their possible contributory importance. Fried [12] cited thirteen cases in which, according to autopsy, there was coexistent tuberculosis. The tuberculosis was of a healing fibrotic type in all instances. Fried denied any causal relationship between the two conditions. Bronchiectasis, as a common inflammatory condition, can be considered more important as a resultant process than as a causative one. Thus Tuttle and Womack [14] among seventy-six patients with bronchiectasis treated in the chest service at Barnes Hospital saw only one who subsequently had bronchiogenic carcinoma.

Olson [8] found only an 8 per cent incidence of primary carcinoma in the lower lobe of the right lung, yet bronchiectasis or abscess is very common there.

With respect to pneumoconiosis, Vorwald and Karr [15] stated that if inhaled dust is of etiologic importance the incidence of pulmonary tumor in pneumoconiotic persons should be higher than in the general population and the dust in question should be irritating to the lung parenchyma and capable of producing carcinomatous proliferation of epithelial tissue. In a significant number of autopsies the incidence of carcinoma of the lung in silicotic persons was no higher than in nonsilicotic persons. These authors said that only recognized carcinogenic substances, radium or tar can be considered possible factors from an inhalation standpoint.

The frequent occurrence of carcinoma of the lung in the Schneeberg mining district has been a cause for much speculation. According to Frissel and Knox [16] this frequency may be related to radioactivity of the inhaled dust. Schmorl, also cited by Klotz,[7] stated that the arsenic content of the dust might be an additional

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The pathologic data are presented through the courtesy of Dr. Edwin F. Hirsch.

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16. Frissel, L. F., and Knox, L. C.: Primary Carcinoma of Lung, Am. J. Cancer **30**: 219-288, 1937.

factor. It is said that the incidence of carcinoma of the lung is decreasing at Schneeberg since the introduction of respirators, which suggests that the factors responsible for the pneumoconiosis are also related to the production of neoplasm. On the other hand, respirators have been used at Joachimstal and the incidence of tumors remains high, with pneumoconiosis uncommon. Silicosis is common elsewhere, but the related incidence of carcinoma is nowhere as great as in this mining district. Teleky [17] stated that "practically, anthracosis and silicosis have no influence on the appearance of lung cancer."

It is worthy of note that according to Alwens and Jonas [18] chrome pulmonary cancer has been included by the German government in its list of professional sicknesses retributable by obligatory indemnity. This disease presents a typical latent period following the occupation as chrome workers. Chrome dust induces inflammatory changes in the respiratory tract. The possible etiologic importance of chrome dust as an etiologic factor is verified by J. Lowy.[19]

From the experimental aspect Vorwald and Karr failed to observe any irritation, hyperplasia or tumor transformation of the epithelium lining the respiratory tract whether the dust was inert or whether it had caused fibrosis of pulmonary connective tissue. Seelig and Benigmus [20] cited the work of Murphy and Sturm, who noted that in mice tarred in various areas of the skin primary tumors of the lung developed. These tumors were designated as a distinct type of epithelial tumor. Murphy and Sturm expressed the belief that tar painting has the constitutional effect of lowering the resistance of the animals and that local irritation grafted on the lowered resistance induces the formation of pulmonary tumor. The results were the same even if the painted area was excised. Andervont, cited by Seelig and Benigmus,[20] secured the same results by injecting dibenzanthracene subcutaneously. This procedure evoked tumors in the lung earlier than at the site of injection. This worker accomplished local application of carcinogenic agents by covering silk threads with molten dibenzanthracene and passing them through the lungs. Pulmonary tumors developed after three months, some of the tumors being squamous cell tumors and some adenocarcinomas. Andervont expressed belief in genetic susceptibility because the incidence was higher in a group of animals that had a higher incidence of spontaneous cancer.

Seelig and Benigmus [20] developed a method of direct application of tar to bronchial and alveolar surfaces without a high death rate. They first used soot swept from the stack of the power house furnace and then used tar free lamp black impregnated with a known quantity of established potent carcinogenic tar. The method was to substitute for the usual shavings used for bedding mice whatever variety of soot, lamp black or dust was to be tested. In six days soot particles were located in the small intrapulmonary bronchi. In five weeks the black particles were abundantly present in the smaller bronchi and alveoli and sparingly present in the interstitial tissue. The first group of experimental animals had four times as many tumors as did the groups of controls.

17. Teleky, L.: Der berufliche Lungenkrebs, Acta, Union internat. contre cancer **3**: 258, 1938.

18. Alwens, W., and Jonas, W.: Der Chromat-Lungen-krebs, Acta, Union internat. contre cancer **3**: 103-114, 1938.

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20. Seelig, M. C., and Benigmus, A. B.: The Production of Experimental Cancer of the Lung in Mice, Am. J. Cancer **33**: 549, 1938.

Schabad [21] further showed that by introducing different carcinogenic chemical products (e. g. coal and tar) in different ways and in different places a considerable augmentation was noted in the quantity of primary tumors of the lung in mice. Schabad also established that the birth of these tumors had no connection with inflammatory manifestations. In a large number of cases such tumors can be produced by subcutaneous or intraperitoneal introduction of blastogenous substances, which completely excludes the necessity for penetration of the agent into the respiratory tract. Descendants of mice so treated have a special susceptibility for primary tumors of the lung. He concluded that experimentally the two principal theories of pathogenesis, inflammatory processes and aerogenous penetration of blastogenous substances, are not confirmed. Koelsch [22] said that irritation due to inhalation of irritating substances is of no etiologic importance.

Hyde and Holmes [23] cited the work of Slye and her co-workers, who developed a strain of mice 100 per cent cancerous and also proved that cancer of the lung in mice is a recessive mendelian characteristic. The intrinsic factor of hereditary susceptibility to tumor formation in human beings is of far greater importance than the extrinsic or environmental factor, according to Klotz.[7]

PATHOLOGY

The primary growth is located more frequently on the right than on the left side, according to most statistical analyses,[24] although Fried [12] in a large series of autopsies found a negligible difference in distribution between the sides. The irregularities of growth render difficult satisfactory classification of gross lesions, and the macroscopic separation of tumors into different groups based on autopsy material is of questionable value.[25] Even at autopsy it often is impossible to relate the tumor to the bronchus of origin, chiefly because of the degenerative changes that often occur and because of the frequency with which secondary infection is superimposed on the neoplastic process. The widespread ramifications of the bronchial system throughout the lung permit an origin in any portion of the latter, but the site of predilection is the main bronchus or its larger branches. The hilar type of lesion is the most common.[26] The main bronchus and the bronchus to the lower lobe on each side are the favorite locations for the neoplasms, accounting for the site of origin in 85 per cent of the cases studied by Vinson.[24] Fried [12] expressed the opinion that the tumor always originates in the main stem of the bronchus or in some of its smaller branches.

Tumors other than the hilar type are variously designated, being called lobular by Geschickter and Denison [26] and nodular by Kerley.[27] The lobular type, described by Geschickter and Denison, arises at the periphery of the lung from the terminal ramifications of the bronchi. They stated that the hilar and lobular varieties are related to the primary embryonic and postembryonic growth centers of the bronchial tree, the

21. Schabad, L. M.: Quelques données expérimentales sur les tumeurs du poumon, Acta, Union internat. contre cancer **3**: 189-195, 1938.

22. Koelsch, F.: Lungenkrebs und Beruf, Acta, Union internat. contre cancer **3**: 243, 1938.

23. Hyde, T. L., and Holmes, G. W.: Roentgenological Aspects of Primary Tumors of Lung, Am. J. Roentgenol. **18**: 235-243 (Sept.) 1927.

24. Vinson, P. P.: Primary Malignant Disease of Tracheobronchial Tree: Report of 140 Cases, J. A. M. A. **107**: 258-261 (July) 1936. Frissel and Knox.[25]

25. Fried,[12] Klotz,[7]

26. Geschickter, C. F., and Denison, R.: Primary Carcinoma of Lung, Am. J. Cancer **22**: 854-877 (Dec.) 1934. Frissel and Knox,[25] Klotz,[7] Mattick and Burke.[26]

27. Kerley, P.: Recent Advances in Radiology, Philadelphia, P. Blakiston's Son & Co., 1936.

former being the locality for bronchial proliferation and the latter for proliferation of the lung buds, whose evolution continues until late childhood. The lobular type is mentioned as being infiltrative in character, and cases are cited in which the infiltration has a miliary distribution. The nodular form is seen as multiple foci of pinhead to bean size which have a tendency to coalesce, raising the question of multicentric origin, and is hard to differentiate from multiple metastasis from an obscure primary growth. It may also be seen as a single peripheral lesion. An additional rare diffuse form is sometimes spoken of.[7] This form may simulate a pneumonic consolidation or an interstitial fibrosis.

Histologically squamous, adenocarcinomatous (with or without mucous secretion) and anaplastic varieties are recognized. Fried [28] emphasized the importance of the basal cell layer in the origin of bronchiogenic carcinoma. He showed that the basal cells have marked

Fig. 1 (case 1).—Hip at time of admission. All symptoms referable to this lesion. Patient died in May 1936 and bronchiogenic carcinoma was found at autopsy.

potentialities for growth and are concerned with epithelial repair, being capable of differentiation into the specialized portions of the bronchial epithelium. Adler [1] in his case analysis stated that often it is difficult to distinguish the kind of epithelial cells that make up the tumor and its structural peculiarities: "One is frequently at a loss to decide whether in the section before him the cells are of epithelial or connective tissue origin, whether it is carcinoma or sarcoma." Adler stated also that the histogenesis was unsettled, being related to problems of epithelial metaplasia: "It is generally impossible to determine the histogenesis of a fully developed tumor." Even now, almost thirty years after Adler's observation, it is sometimes difficult to establish the histogenesis of bronchial neoplasms. It was his conviction that bronchial epithelium is a highly plastic material designed to accommodate itself in manifold ways to demands which local physiologic and pathologic conditions require. This view is subscribed to by Tuttle and Womack,[14] who expressed the opinion that hyperplastic and metaplastic lesions of the lung are protective rather than precancerous mechanisms. They stated that the ease with which bronchial epithelium becomes stratified and squamous explains the frequency with which this sort of epithelium is encountered in bronchiogenic carcinoma.

The importance of the basal cell layer in histogenesis, in accordance with Fried's theory, is affirmed by Edwards [4] and Graham,[5] and Klotz [7] quoted Weller, who would depict graphically the histologic relationship between the different types of bronchiogenic carcinoma by a Y, the stem of which represents the anaplastic group. The two arms of the Y represent differentiation toward epidermoid or adenocarcinomatous types, the upper part of the arm indicating the highest degree of differentiation.

The squamous cell type of tumor is the most common,[29] but the classification of a tumor must be accepted with reservations, because different sections of the same tumor may present different microscopic features. A common cellular origin from epithelial basal cell deposits would predispose toward pleomorphism.[30] Thus in our series the tumor in one case was considered a sarcoma when tissue from a pleural portion was removed at thoracotomy. Later, on removal of the lung, the primary tumor was found to be a bronchiogenic carcinoma with extension to the pleural surface at the hilus.

The primary lesion spreads by way of the peribronchial lymphatics, and peripheral tumors often simulate metastatic or pleuritic growths. Pleuritic involvement may induce effusion into the pleural cavity. Extension to the regional and mediastinal lymph nodes is common, and mediastinal tumors may attain considerable size, not often, however, reaching the size of lymphoblastomas. Often the patient's initial consciousness of a pathologic process arises from a metastatic manifestation. Thus 12 per cent of Rogers' [31] fifty patients who were examined post mortem went through the entire illness without a pulmonary symptom, and with 44 per cent a sign of metastasis was the initial symptom of illness. Arkin and Wagner [32] in an analysis of 135 cases found predominant extrapulmonary signs and symptoms in one half.

The tendency of bronchiogenic carcinoma to cause widespread and early metastasis is well known. The situation of the lung in the circulatory system would favor generalized hematogenous dissemination.[7] Tumor emboli from primary sources other than the lungs would tend to be filtered out in these organs and thus fail to reach remote foci. Central nervous system foci of metastasis, especially in the brain and adrenals, are a common observation. Adrenal involvement is said to cause a syndrome similar to Addison's disease. Extension to regional lymph nodes is most common, with the liver, abdominal lymph nodes, kidneys and bones other frequently observed sites. Rosedale and McKay [33] emphasized that metastatic bronchiogenic carcinoma is worthy of consideration in the case of any obscure intra-abdominal lesion.

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30. Mattick, W. L., and Burke, E. M.: Primary Bronchiogenic Carcinoma from Pathologic and Radiologic Points of View, J. A. M. A. **100**: 2121-2125 (Dec. 25) 1937.

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32. Arkin, A., and Wagner, D. H.: Primary Carcinoma of the Lungs: A Diagnostic Study of 135 Cases in Four Years, J. A. M. A. **106**: 587-591 (Feb. 22) 1936.

33. Rosedale, R. S., and McKay, D. R.: A Study of 57 Cases of Bronchiogenic Carcinoma, Am. J. Cancer **30**: 493-506 (March) 1936.

Secondary pathologic features related to bronchial obstructions are common; the tumor may obstruct the bronchus by intraluminal growth or by invasion of the wall, producing constriction. Pressure on the bronchus by a peribronchial tumor is an occasional process; ulceration may or may not occur. Obstruction causes defective drainage,[34] with consequent infection. Chronic bronchiectatic, suppurative, pneumonic and pleuritic phenomena in any combination may thus ensue. Atelectasis may complicate the obstruction and perpetuate the infection.

PROGNOSIS

The prognosis in all cases is very poor, the patient who lives two years after coming under clinical observation being exceptional. The prognosis is modified by the predominant cell type of the tumor and by secondary infectious processes induced by bronchial obstruction.

SYMPTOMATOLOGY

In our series of twenty-three cases the diagnosis in every instance was established by microscopic examination, on the basis either of biopsy or of autopsy. In eleven instances the diagnosis was determined by autopsy, in six instances by bronchoscopic biopsy, in two instances by operation and in one instance by punch biopsy. In three cases the diagnosis was presumed on the histologic character of supraclavicular lymph node biopsy.

The duration of symptoms before the patient seeks medical aid is often striking, and Farrell [36] found that more than one half of fifty patients did not seek medical advice until the first symptoms had been present for a year or more. We agree with Vinson [24] that all chronic pulmonary diseases have similarity of symptoms. Bronchiogenic carcinoma may simulate any condition, and the protean nature of its symptoms is borne out by a review of our series.

The symptoms are modified of course by the location of the neoplasm and the mechanical changes it induces in the bronchiopulmonary system and the neighboring structures. The average age was 51, and all but four patients were males. It is well to remember that these tumors occur at an earlier age than one generally associates with malignant growth. McRae [37] found 50 per cent of sixty-one patients not over 45, while Stein and Joslin [38] found 65 per cent of 164 patients between 40 and 60.

Hemoptysis can probably be considered the chief subjective sign, and when presented by a patient of middle age it carries diagnostic significance and merits the suspicion of a bronchiogenic carcinoma. In our twenty-three cases, hemoptysis occurred eight times, or in 34 per cent of the cases, at some time during the clinical course of the illness. As the presenting complaint, hemoptysis occurred only three times. Dyspnea occurred nine times, or in 38 per cent of the cases, and was the presenting complaint twice, the clinical picture in one case being confused by the coexistence of decompensated syphilitic heart disease. Pain in the chest proved severe in eight cases, in five of which it was the presenting complaint. Productive cough was present in nine cases and was the chief complaint in three cases at the time of admission to the hospital. Hoarseness occurred five times. In one case the upper lobe of the left lung was implicated, as established at autopsy, and this easily accounted for the presence of hoarseness. In the other four cases the hoarseness was not so easily explained. Dysphagia is an unusual symptom and was present once, being attributable to displacement of the lower part of the esophagus by the tumor.

Three, or 13 per cent, of the patients had no symptoms referable to the respiratory tract and no physical signs referable to the pulmonary lesion at any time during their illness:

CASE 1.—*Femoral metastatic carcinoma from a bronchus simulating osteogenic sarcoma.* P. W. H., a Negro aged 35, admitted to the hospital complaining chiefly of pain in the left hip of two months' duration, had no respiratory symptoms. A large, firm, fixed mass in the region of the greater trochanter was found. X-ray examination (fig. 1) revealed a destructive lesion not unlike an osteogenic sarcoma. A chest film (fig. 2) indicated the presence of a nodular area in the right side of the chest which had the appearance of a metastasis. Death occurred in May 1936, approximately four months after the onset of the patient's illness. At autopsy a primary bronchiogenic carcinoma of the lower lobe of the right lung was found. The bronchus to the upper portion of this lobe for a length of 3 cm. had a tumor surrounding it like the cap of a mushroom. The tumor measured 7 by 6 by 7 cm. The lumen of the involved bronchus was not occluded. There was a metastatic carcinoma involving the left femur and the submental, cervical, axillary, inguinal, iliac, periaortic and left femoral lymph nodes. There was a pathologic fracture of the left femur. Histologically the tumor was of an anaplastic type.

Fig. 2 (case 1).—Area at right hilus which was thought metastatic from lesion of hip.

In five cases, including the three reported, there were presenting complaints due to a remote metastatic manifestation of the disease. Three of these five patients sought medical aid because of pain in some portion of the spine, two because of cervical pain. One patient complained chiefly of pain in the hip on admission and another of pain in the groin.

A history of a complicating infectious process was present in nine cases.

ROENTGEN SIGNS

The roentgenographic data on the chest in our cases showed a high degree of variability, as might be expected from the unpredictable growth behavior of the neoplastic lesions. The inadequacy of gross classification establishes the futility of roentgen classification. The more patients we see the more we are inclined to agree with Peirce [39] concerning the inconstancy of roentgen pattern. Manges [24] stated that "the disease has no single characteristic roentgen sign. It appears in various locations, sizes, shapes and densities, involves

34. Manges, W. F.: Primary Carcinoma of Lung, Am. J. Roentgenol. 27:858 (June) 1932.
36. Farrell, J. T., Jr.: Diagnosis of Bronchial Carcinoma: Clinical and Roentgenologic Study of 50 Cases, Radiology 26:261-269 (March) 1936.
37. McRae, T.: Bronchial Neoplasm: Clinical Features, Arch. Otolaryng. 12:727 (Dec.) 1930.
38. Stein, J. J., and Joslin, H. L.: Carcinoma of the Bronchus, Surg., Gynec. & Obst. 66:902, 1938.
39. Peirce, C. B., and Ingersoll, C. F.: Bronchiogenic Carcinoma, Indust. Med. 6:411-422 (July) 1937.

small or large area; causes varying amounts of displacements of organs, different degrees of functional interference, at times out of all proportion to the size of the actual growth." Christie [5] added that "elaborate classifications have added little to our ability to make a correct diagnosis."

Fig. 3 (case 21).—Destructive process involving cervical spine in November 1933. No pulmonary signs or symptoms during illness. Autopsy in December disclosed very small bronchiogenic carcinoma.

The direct roentgen sign, and probably the one most suggestive of primary carcinoma, is the presence of a fairly homogeneous shadow, well defined, usually at or near the hilus. This shadow, however, may send extensions into the lung field.[40] Thus in case 1 (fig. 2) the dense, well circumscribed hilar shadow produced no modification in the shadow of the portions of the lung

TABLE 1.—*Presenting Complaints*

1. Pain in skeletal system	5
Cervical portion of spine	2
Dorsolumbar portion of spine	1
Bony pelvis	1
Hip	1
2. Productive cough	3
3. Pain in chest	5
4. Hemoptysis	3
5. Dyspnea	2
6. Fever	1
7. Hoarseness	1
8. Dysphagia	1

(Two patients admitted to hospital with diagnosis already established.)

peripheral to the lesion. In three other cases (15, fig. 5; 17, and 19, fig. 6) there were definite, circumscribed, oval or circular masses, one of which was separated from the hilus. In this connection it is interesting to note the hilar shadow in the left lung in a case in which the shadow was due to metastasis to regional lymph nodes from a primary lesion of the opposite lung.

The indirect roentgenographic signs are dependent on the modification in the shadow of the portions of lung peripheral to the site of the lesion. Thus there may be produced emphysematous or atelectatic phenomena consequent on partial bronchial obstruction or obstruction. We have no cases illustrative of partial obstruction or obstructive emphysema, though such a mechanism has been described in connection with bronchiogenic carcinoma. Such cases have been recorded.[41]

In the event of obstructive emphysema, air finds ready entrance to the lung but difficult exit. Films taken during inspiration may show no abnormality; films taken during expiration show a definite mediastinal shift away from the side of the lesion.

TABLE 2.—*All Symptoms Elicited at Some Time During Illness*

1. Loss of weight	9
2. Hemoptysis	8
3. Dyspnea	9
4. Skeletal pain	6
5. Productive cough	9
6. Chest pain	8
7. Hoarseness	5
8. Dysphagia	1

A more common complication is the production of collapse of the lung or a part of the lung by complete obstruction by the tumor of the lumen of the bronchus supplying that portion of the lung. The mechanism of bronchial obstruction depends either on intraluminal growth of the tumor or on mural growth with constriction of the bronchus.[42] In either instance the reduction

Fig. 4 (case 3).—Sagittal section of right lung obtained at autopsy.

in the size of the air passage may be accentuated by edema and thus may vary from day to day. The observations at autopsy may be misleading in that they show apparent patency of a bronchus, although films taken before death indicated probably complete obstruction.

40. Carman, R. D.: Primary Cancer of Lung from Roentgenologic Viewpoint, M. Clin. North America **5**: 307 (Sept.) 1921. Manges.[41]

41. Manges, W. F.: Bronchial Neoplasms: Roentgenologic Aspects, Arch. Otolaryng. **12**: 732-738 (Dec.) 1930.

42. Hirsch, I. S.: Roentgen Diagnosis of Malignant Neoplasms of Lung, Radiology **9**: 470-496 (Dec.) 1927. Christie.[5]

In one instance the primary tumor involved the bronchus to the upper lobe of the left lung, yet there was a marked compression atelectasis of the lower lobe, accompanied by bronchiectasis. Here the tumor involving the bronchus to the upper lobe had apparently produced external compression of the bronchus to the lower lobe. The atelectatic process is of slow development when compared to the atelectasis of foreign body origin.[43] Thus in one case two films taken six weeks apart showed the slow progress of an atelectatic process. Kerley[27] expressed the opinion that deaeration of the lung begins in the least expansile portions, that is, at the apex or in the periphery just below the clavicle, especially with involvement of a bronchus to an upper lobe. He also said that mediastinal shift is greater with lesions of a lower lobe than with lesions of an upper lobe. In one case, mediastinal shift due to an obstructing mass in the left main bronchus was demonstrated. The homogeneous opacity is partly due to pleural fluid. In addition there was narrowing of the esophagus, an uncommon observation.

Complete or partial collapse of the lung creates a favorable nidus for infection, probably on the basis of defective drainage, an infectious process furnishing the background for frequent complications. Thus the massive obstructive pneumonia involving the lower and middle lobes of the right lung and the empyema account for one picture observed. Also the breakdown of tissue at the site of the lesion in the upper lobe of the right lung produced a picture which simulated a pulmonary abscess. The upper lobe of the left lung in one case was occupied by a bronchiectatic and suppurative pneumonic process. Pleural fluid may be the result of extension of parenchymal infection of the lung or may perhaps be the result of pleural metastasis.

For clarification of the nature of the roentgen signs of fluid, tumor masses or obstructive phenomena in cases in which there is a possibility of bronchiogenic carcinoma, the usual examination of the chest should be supplemented by lateral and oblique views. In the presence of a large, homogeneous shadow occupying the greater portion of a lung field, a "hard" film may localize a definite tumor mass or be of definite value in establishing the site of pathologic change. Films taken after thoracentesis are to be recommended. Roentgenoscopic examination is an important phase of the examination, and bronchograms are useful. The value of films taken during different phases of respiration has been mentioned.

An additional change occasionally observed is the presence of an infiltration process extending outward into the lung field. This was well illustrated in one case in which the diffuse infiltration was due to pulmonary lymphatic dissemination from a relatively small primary tumor involving the right main bronchus.

In recapitulation, we had direct evidence of a tumor in only six cases. In thirteen cases the presence of tumor could be inferred only from evidence of secondary pathologic processes. In four cases the roentgen evidence of tumor was vague or lacking entirely.

The roentgenologist occupies a pivotal position in the elucidation of positive signs referable to the chest and, working in close cooperation with the bronchoscopist, can render the early diagnosis of bronchiogenic carcinoma more of a certainty when the internist's evaluation of the history suggests the possibility of such a lesion. Bronchoscopic examination should be done in all cases of obscure involvement with evidence of bronchopulmonary pathologic change.[44]

From the standpoint of differential diagnosis the following points are offered, though we recognize the definite limitations in their usefulness: Tumors of the lymphoblastoma group are apt to produce more embarrassment of mediastinal structures; their shadows are usually larger, they are nodular and often bilateral and they are much more radiosensitive, a differential point in diagnosis of great value.[24] Dermoid tumors are always connected with the anterior mediastinum, often cast a homogeneous, rounded, well encapsulated shadow and may show calcification.[45] Osteoma of a rib or osteochondroma of the sternum can be identified with their places of origin by careful roentgen study in different projections. Neurofibroma occasionally produces a dense shadow in the lung field, but changes in the dorsal vertebrae can usually be determined if proper films are taken. Neurofibroma is probably the commonest tumor of the posterior mediastinum. Paravertebral shadows and cardiovascular lesions are unlikely to be confused with bronchiogenic lesions. The usual discrete nodular character, multiplicity and frequent bilaterality of pulmonary metastatic foci are distinguishing features. However, pulmonary metastasis may be massive and infiltrative[42] and primary carcinoma may have a miliary distribution, and differentiation at times is impossible.

Fig. 5 (G. C.).—Chest in two views showing tumor of right lower lobe. Patient died in June 1938, several days after lower and middle lobes were removed.

With distinguishing pulmonary lesions due to foreign body the history is of great importance.[41]

Inflammatory conditions of an acute nature may initiate the clinical picture of a bronchiogenic neoplasm, and only when convalescence is unduly prolonged does a primary malignant process become suspected. Chronic inflammatory processes are, in the majority of instances, bilateral. An exception is noted in the case of foreign body. In this regard it is rare indeed when the history will not establish the diagnosis of foreign body.

Tuberculous lesions of sufficient size to offer diagnostic difficulties evolve in one direction or the other in a relatively short period of observation. The hilar region, a common location for tumor, is a rare site for adult tuberculosis, and even more rare would be hilar tuberculosis without a parenchymal lesion.

SUMMARY

The pathologic, clinical and roentgen features of twenty-three proved cases of bronchiogenic carcinoma emphasize the protean manifestations of this disease.

43. Golden, R.: Effect of Bronchostenosis upon Roentgen Ray Shadows in Carcinoma of Bronchus, Am. J. Roentgenol. **13**: 21-30 (Jan.) 1925.

44. Holinger, Paul: The Diagnosis of Bronchiogenic Carcinoma—Bronchoscopic Aspects, Illinois M. J. **72**: 431-434 (Nov.) 1937.

45. Farrell, J. T., Jr.: Roentgen Diagnosis of Intrathoracic Neoplasms, Radiology **13**: 1-16 (July) 1929.

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In conclusion we quote an important and pertinent statement made by Dr. G. W. Scupham, of Chicago: "Whenever pulmonary symptoms, particularly dyspnea and pain, are out of proportion in their severity to x-ray or physical findings, bronchiogenic carcinoma is likely."

ABSTRACT OF DISCUSSION

DR. LEROY SANTE, St. Louis: All will agree with the authors about the inconsistencies of the x-ray appearances in bronchogenic carcinoma in the chest. Their wide variety is notorious and it is a challenge to see whether we cannot bring some order out of chaos. If we bear in mind the two fundamental types of involvement described by Ewing, it will at least afford a basis on which to formulate the diagnosis. The nodular type of carcinoma that tends to remain local springs from the superficial layers, grows as a nodule and by occlusion leads to atelectasis. The second type springs from the deeper bronchial layers, has a tendency to metastasize, has a tendency to break down in the center forming abscesses, and simulates a pyogenic abscess so closely that one cannot tell them apart, even at autopsy. If these facts are borne in mind and the x-ray observations are correlated with the clinical symptoms, we shall have a better opportunity of arriving at a correct conclusion. One is dependent here more on correlation with the clinical history than in any other condition in the chest. The relatively long duration of carcinomatous conditions without febrile reaction is a point to which a great deal of weight should be given. If, in addition, there is bloody expectoration, this is additional evidence of carcinoma. If one has the opportunity of examining a patient over a considerable period of time and can see an increase in the size of the lesion, it becomes evident that one is dealing with a new growth. With massive lesions in the chest especially when there is a febrile reaction the difficulties begin and sometimes it is almost impossible to determine the true nature of the condition. If massive atelectasis suddenly develops without any other evident cause, it is a manifestation of the nodular type of carcinoma, which occludes the bronchus. Occasionally lesions develop on the pleural surface, giving rise to pleural effusion. Aspiration of some of the fluid, allowing a little air to get in, will permit one to see the character of the lesion on the surface. Massive involvement may present difficulties. A lateral view may show such enormous masses extending from the posterior wall of the chest. Such a condition may, in the presence of a febrile reaction, give one the impression of a localized effusion. Still other cases occur in which localized pleural effusions give the appearance of rounded nodules in the region of the interlobar space, resembling tumor. In subsequent examinations in a few weeks these may show increase in size from accumulation of fluid which could easily be mistaken for carcinoma.

DR. ROSS GOLDEN, New York: By analysis of a series of cases like this made by Drs. Jenkinson and Hunter, our knowledge of the x-ray manifestations of these processes is improved. A point worthy of emphasis is the importance of the physical situation of the growth in the x-ray appearances and in the clinical evidence of the disease. The growths which arise out in the periphery manifest themselves differently both on the x-ray films and clinically from those in the larger bronchi. The growths that arise in the larger bronchi cause earlier and more serious disturbance in the pulmonary function and the symptoms are likely to be based on that disturbance for a while. Another point to emphasize is the value of injecting iodized oil through the glottis. It does not have to be done by bronchoscope but can be done through the glottis. Very important information may be thus obtained. The importance of bronchoscopy itself in the diagnosis of carcinoma of the bronchus must not be forgotten.

DR. R. G. TAYLOR, Los Angeles: There is one thing in connection with the diagnosis of these cases that has not been mentioned; probably it has only been overlooked. That is, in these dense areas in which the ordinary film gives no detail, an overexposed film or one made on the Bucky diaphragm gives more detail in the dense lung areas. It is worth trying and frequently one gets additional information.

DR. EDWARD L. JENKINSON, Chicago: We did not show slides or films for one specific reason. Dr. Hunter and I have been working on this paper for about two years, and we have gone over numerous films with the idea of picking x-ray appearances which might be characteristic of primary lung neoplasms. From our experience we have been unable to determine anything characteristic of neoplasms from the x-ray appearances. The shadows were usually bizarre and might well be due to various other diseases. From our experience we believe that bronchiogenic carcinoma is still a diagnostic enigma. We concur in what Dr. Sante said with regard to serial films. They are an aid, along with clinical observations, in at least arousing one's suspicions that a malignant condition exists. Two of our patients showed only small infiltrating lesions along the left upper lobe bronchus. The patients were in an excellent state of health and complained only of a slight pain in the upper left chest. From the x-ray appearances it was impossible to differentiate these lesions from many other lesions which might occur in the upper lobe. Dr. Chevalier Jackson examined one of these patients with the bronchoscope, but as the lesion was in the left upper bronchus it was impossible to get a specimen. The injection of iodized oil revealed a blocking of the left upper lobe bronchus. When the patient was irradiated the upper lobe lesion completely disappeared. Later on Dr. Jackson found a squamous cell carcinoma, proved at biopsy, in the left main bronchus. We agree with Dr. Taylor that overexposed Bucky diaphragm films will often be of aid in recognizing neoplasms in the lungs. The planograph, we believe, is of greater value than the dark film. Fever was present in many of our reported cases.

RECONSTRUCTIVE AND STABILIZING SURGERY

FOR RESIDUAL SUPPURATIVE ARTHRITIS OF HIP JOINT: A STUDY OF FORTY-SIX UNSELECTED CASES

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Between the years 1919 and 1937, thirty-eight patients had forty-six operations at the New York Orthopaedic Dispensary and Hospital for the reconstruction or stabilization of a hip joint that had been damaged or destroyed by previous suppurative arthritis. The experience with these cases and the results that have been obtained are now reported. After a careful review of the histories and roentgenograms, it is felt that all these persons had actually had suppurative arthritis.

The operations consisted of twenty reconstructions, four arthroplasties, seven shelf stabilizations and fifteen fusions, and they will be discussed in this order. There were no operative deaths. One patient, a child, died six years later from spinal meningitis.

THE RECONSTRUCTIONS

Reconstructions numbered twenty and were performed on eighteen patients, who varied in age from 1½ to 17 years and averaged 9. Two each had a second reconstruction on the same hip one year later. The average time of operation after the initial infection was six years, varying from fourteen months to sixteen and one-half years.

The amount of joint damage was staggering. Extensive destruction of the femoral head and neck was the rule, and 70 per cent of the hips were dis-

From the New York Orthopaedic Dispensary and Hospital.
Read before the Section on Orthopedic Surgery at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

located. The type of original infection is not known except in three cases, in two of which it was due to a staphylococcus and in one to a pneumococcus. There were no draining sinuses at operation. Drainage occurred postoperatively in two cases, or 10 per cent. At follow-up examination all patients were free from sinuses.

Fig. 1.—Reconstruction in S. B., a girl of 9 years; bifurcation procedure. *A*, before operation; *B*, eight months after operation; *C*, eight years after operation. Result: no pain, flexion mobility 40 degrees, index 22, dislocation cured, shortening 1 inch and moderate limp. The patient dances, skates and can walk thirty-eight blocks.

The type of reconstructive procedure varied chiefly in relation to the extent of joint damage. In general, if sufficient length remained, the neck was shaped and placed in the acetabulum and the trochanter was usually transplanted downward (five cases). If the neck had been completely destroyed, the end of the femur was bifurcated, the outer or trochanteric portion wedged outward and the medial portion reduced into the acetabulum (eight cases). In four cases the trochanter or abductor attachment alone was moved downward, and the end of the shaft was placed in the acetabulum. In one case with bony ankylosis, a supporting ledge or

TABLE 1.—*Example: Index of Function of Normal Hip*

Arc of Motion	Degrees of Motion	Factor	Product
Flexion	145	0.4	58
Extension	10	0.1	1
Abduction	45	0.4	18
Adduction	30	0.2	6
Internal rotation	30	0.2	6
External rotation	60	0.1	6
Index of function			95

shelf of bone was fashioned beneath which the liberated end of the femur was placed. Bony ankylosis recurred. In another case with marked overproduction of bone a naturally formed ledge was utilized as a shelf, and the reshaped upper end of the femur was placed in a notch beneath it. This patient when last seen, a year later, had 70 degrees of painless anteroposterior mobility and a stable hip. A Colonna procedure was employed in one case but failed, primarily because of insufficient acetabular depth. The acetabulum was made deeper in half the cases exposing bone in two and probably in five. An entirely new acetabulum was constructed in one. In two cases a shelf was also turned down from the ilium over an insufficient and oblique socket.

All patients were placed in plaster spicas after operation, and motion was begun in from one and one-half to twenty-eight weeks with an average of twelve. The records do not state why immobilization was continued for so long, but the most probable reason was the high percentage of preoperative dislocation and attendant instability.

Physical therapy was given in the forms of massage and exercise and was continued as long as the patient was in the hospital and as long as he would return to the clinic.

Results.—Follow-up examinations were made on all the patients from one to fifteen years after operation with an average of six years; expressed as case years, the average time was eleven.

Pain: Three patients had pain before operation and five, or 28 per cent, after. The low incidence of preoperative pain was probably due to the youth of the patients (average 9 years) and to the high proportion of dislocation (70 per cent). The relatively low percentage of postoperative pain, 28, is gratifying; but

TABLE 2.—*Index of Function of Hip Expressed in General Terms*

	Index
Hypermobile	Over 110
Normal	90-110
Good	60- 90
Fair	50- 60
Indifferent	40- 50
Poor	30- 40
Bad	Under 30

only four of the patients have reached adult age. These four, now ranging in age from 20 to 28 years, are without pain, but two have had a recurrence of bony ankylosis, one a thin joint space with irregular articulating femoral surface and practically absent motion (index 2, described in the next section), and another a smooth stump of femoral neck articulating with a small residual socket and presenting an index of 28. It is probable that when the rest of these patients have been followed into adult life a higher percentage of pain will be found.

Motion: In order to express simply and completely the range of mobility in any given hip joint, the index of function was used that was described by Ferguson and Howorth.[1] To obtain this index, the degrees of

Fig. 2.—Reconstruction in W. Y., a boy of 13 years; bifurcation procedure. *A*, before operation; *B*, eight months after operation; *C*, thirteen years after operation. Result: no pain, index 2, shortening 1½ inches and moderate limp. The boy plays baseball and basketball and can walk 3 miles.

motion present in each arc of mobility are multiplied by a suitable factor the size of which depends on the relative importance of that particular arc for function of the hip as a whole. The products are added, and the sum is the index of function. The normal hip has an index of from 90 to 110. Table 1 is an illustration.

1. Ferguson, A. B., and Howorth, M. B.: Slipping of Upper Femoral Epiphysis, J. A. M. A. 97:1867 (Dec. 19) 1931.

Before operation 70 per cent of the hips dislocated, and the index of function varied from 0 to 110 and averaged 64. After operation 20 per cent dislocated, and the index ranged from 0 to 69, averaging 20. Three operations resulted in bony ankylosis. The results are presented in table 3.

Dislocation: This complication was present preoperatively in fourteen cases, or 70 per cent, and was

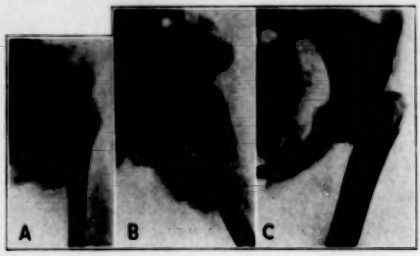

Fig. 3.—Reconstruction in C. M., a girl of 8 years; bifurcation procedure. *A*, before operation; an unsuccessful reconstruction was performed on this hip one year previously; *B*, three months after operation; *C*, thirteen years after operation. Result: no pain, occasional stiffness, flexion mobility 35 degrees, index 28 and shortening 2 inches. The patient works in an office, dances and walks sixteen blocks a day in the city and a great deal in the country on week ends.

relieved by operation in all but five. Postoperative roentgenograms showed that in four cases the displacement was present immediately after operation. Manipulations were done in three cases, unsuccessfully in two and successfully in one but followed later by redislocation. The fourth hip joint was considered to be stable enough, although subluxated, and was not manipulated; but dislocation occurred subsequently. The fifth joint, treated by a Colonna reconstruction, dislocated after eight weeks when taken out of plaster because of insufficient acetabular depth.

Shortening: The average amount was 1½ inches (3.8 cm.) before operation and the same after. It varied from one-fourth inch (0.6 cm.) of lengthening in one case, due to osteomyelitis and shortening of the opposite tibia, to 3 inches (7.6 cm.).

Limp: Preoperatively, every patient had a limp; and at follow-up examination, except for one instance in which a specific statement was not made, a limp was present in each case. The limp was not usually described before operation; but after, it was noted as severe in six cases, moderate in six, slight in three and merely present in four. In all the six cases in which there were marked limps, mobility was absent or greatly restricted, and there were also present one or more of the following factors: pain, dislocation, shortening of 1 inch (2.5 cm.) or more and pronounced flexion or adduction deformity (over 35 degrees of the former and 15 degrees or more of the latter).

Subsequent Operations: Nine subsequent operations were performed on eight patients. These included one open release of hip flexion deformity, one arthroplasty, one shelf stabilization and four fusions, all performed on previously reconstructed hips, one supracondylar osteotomy for external rotation deformity and one for anteversion of the femoral neck.

THE ARTHROPLASTIES

In four cases conditions were such as to make possible the fashioning of a more or less characteristic articulation with the employment of interposed tissue. These procedures have been designated as arthroplasties in contradistinction to the reconstructions that have just been discussed.

The ages of the patients varied from 14 to 17 years, and the average time of operation after the original infection was six years. The organisms responsible for the joint damage are not known, but in one case Staphylococcus aureus was cultured from the bone at operation. Two of the patients presented a bilateral bony ankylosis and one a fibrous ankylosis on one side (index 6) and a bony ankylosis on the other. They were extremely handicapped. The fourth had a unilateral fibrous ankylosis with a functional index of 5. There were no dislocations.

In the cases of bony ankylosis, new heads and sockets were constructed out of solid bone; in the two with fibrous ankylosis, both femoral heads were made much smaller, and in one the acetabulum was made deeper.

The tissue that was interposed consisted of a double layer of fascia lata in one case, a single layer in two cases and a thick peduncular flap of fibrous tissue in another case.

None of the patients had sinuses at the time of operation. Preoperatively, they had been present in two but had closed three and six years before. In the other two, it is not recorded whether sinuses had ever been present or not. Three patients developed drainage after operation, after ten days, three months and seven months, respectively. It was in this first case that Staphylococcus aureus was cultured at operation, although all sinuses had been closed for three years.

At follow-up examination, all patients were without sinuses.

Plaster was applied after operation and in addition skin traction was used twice. Motion was begun in from three to six weeks, the period averaging four weeks. Manipulations under anesthesia were given in one case to maintain motion, but subluxation resulted, and bony ankylosis recurred.

Results.—The average time of follow up examination was eight case years and varied from four to fifteen years.

Pain: Before operation, only one patient complained of pain, and after, also only one. The patient who

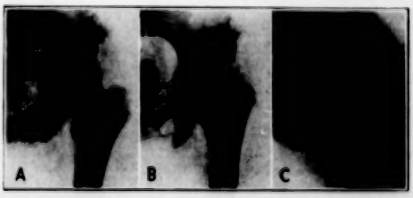

Fig. 4.—Arthroplasty in A. S., a girl of 14 years. About three fourths of the head was resected, and a single layer of fascia lata was interposed. Staphylococcus aureus was cultured from the bone at operation, and sinuses developed on the tenth day. *A*, before operation; *B*, one year after operation; *C*, three and one-half years after operation. Result: no pain, flexion mobility 20 degrees, index 4 and no sinuses.

previously had pain, a boy of 17 with a fibrous ankylosis of one hip and an index of 5, was entirely relieved; at present, fifteen years later, at the age of 32, he has 50 degrees of flexion mobility but limited lateral motion and rotation. The patient who since operation has had pain and who previously had a bony ankylosis of both hips now has a sensitive fibrous ankylosis with only 5 degrees of anteroposterior mobility.

Two patients have reached adult age and are free from pain. One, however, has a recurrent bony ankylosis, and the other, the man of 32, a movable hip with a fair range of flexion mobility.

Motion: Before operation, two patients presented bony ankylosis and two fibrous, both with indexes of 10. After operation, in the first two bony ankylosis

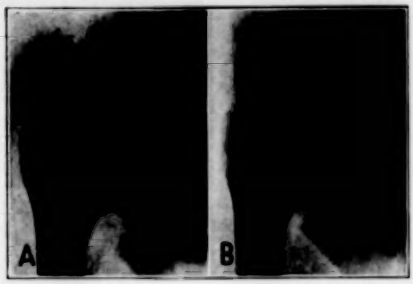

Fig. 5.—Arthroplasty in H. F., a boy of 17 years. The preoperative film has been discarded. The femoral head was considerably reduced in size and the acetabulum was made deeper. A single layer of fascia lata was interposed. Motion was begun at three weeks. *A*, two and one-half years after operation, and *B*, fifteen years after operation. Result: no pain, flexion mobility 30 degrees, index 26, shortening 1¼ inches and slight limp.

redeveloped and the other two obtained motion with indexes of 5 and 26.

Limp: All four patients limped preoperatively, three badly because of bilateral involvement and absence of motion. After operation, these three still limped severely because of recurrence of bony ankylosis in two and failure to develop any more than a slight amount of motion in the third. The one patient with unilateral involvement, the man now 32 years of age, walks extremely well and has only a slight limp. He has a

TABLE 3.—*Functional Results of Reconstruction*

Function	Index	No. of Cases
Normal	90-100	0
Good	60-90	3
Fair	30-60	9
Poor	1-30	12
No motion	0	4
		29

flexion and external rotation deformity of respectively 20 and 35 degrees, 1¾ inches (4.5 cm.) of shortening and excellent flexor, extensor and abductor hip muscles.

THE SHELF STABILIZATIONS

In seven cases, with dislocations in six and subluxation in one, shelves were constructed above the displaced femurs to achieve stability and preserve motion. In six the shelves were turned down from the ilium, and in one a section of iliac bone was turned outward and upward and the intervening space filled in with fragments of bone.

The patients varied in age from 2 to 19 years and averaged 10. The time of operation after the original infection also ranged from two to nineteen years, averaging nine. The disease began in one at the age of 3 weeks.

Two of the patients complained of pain, and all had a limp. The average amount of shortening was 1.7 inches (4.3 cm.). No sinuses were present at operation or at follow-up examination, and none developed postoperatively. The causative organisms are not known except in two cases, in both of which it was a pneumococcus.

Postoperative x-ray films demonstrated adequate shelves in five cases. In one the shelf was placed too high, but the femur in later years either grew or ascended to its level and finally came to rest securely beneath it. In another case the shelf was placed too obliquely. It was revised but two months later had become again too oblique. A second revision was performed, and the shelf was also moved down three-eighths inch (1 cm.); but subsequent x-ray studies revealed still too high and oblique a position. In six years the femur had either grown or ascended to the level of the shelf but would not remain beneath it except while traction was maintained on the leg. This patient was only 2½ years old at the time of operation, and the shelf was turned down from the ilium. It is now our custom to postpone shelf stabilization if possible until the child is a few years older and the ilium is better developed, and to drive a free graft of iliac bone into the ilium immediately above the displaced femur to obtain accurate placement more readily.

Results.—Follow-up examination varied from one and one-half to twelve years after operation and averaged six case years.

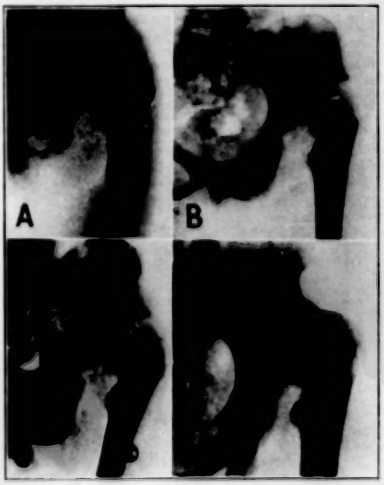

Fig. 6.—Shelf stabilization in M. S., a boy of 5 years. A large mass of bone was turned up and outward, and the resultant triangular space was filled with bone. Too high a position was obtained, but in later years the femur grew and ascended to the level of the shelf. *A*, before operation; *B*, five months after operation; *C*, one and one-half years after operation; *D*, nine years after operation. Result: slight pain only when roller skating, flexion mobility 75 degrees, index 46, abductor muscle power 70 per cent of normal and marked limp. The shelf offers oblique support. The patient works as a grocery clerk and is on his feet all day without any trouble.

Stability: X-ray observation at the time of follow-up examination revealed three adequate shelves, two instances of complete shelf absorption and two dislocations from beneath a shelf. In one of the latter, the shelf was ineffective because of too much obliquity. In the other, it appeared to be adequate, but beneath

it there was a laterally protruding ledge of bone that was apparently levering the femur out of place.

The shelves that underwent complete absorption had been turned down in two patients respectively 10 and 15 years of age. Postoperative x-ray films showed apparently well constructed shelves placed within one-fourth inch (0.6 cm.) or less of the end of the femur.

Fig. 7.—Shelf stablization in F. S., a boy of 15 years. The femur was pulled down, and a shelf was turned down from the ilium. *A*, before operation; *B*, immediately after operation; *C*, seven years after operation. Result: frequent pain on beginning to walk, flexion mobility 115 degrees, index 66 and complete absorption of the shelf. The patient can walk several miles but had to give up delivering groceries because of pain.

Absorption was noted in one after three months and estimated at 60 per cent in the other after ten months. One shelf, placed too high in a boy of 5, underwent partial absorption, which fortunately was insufficient

TABLE 4.—*Results of Reconstructive and Stabilizing Procedures*

	Reconstructions	Arthroplasties	Shelf Stabilizations	Fusions
Number	20	4	7	15
Average age, yr.	9	15	10	18
Average time of follow-up examination, case yr.	11	8	6	7
Pain before	3	1	2	10
Pain after	5	1	4	1
Average index before	64	5	75	19
Average index after	20	6	51	..
Dislocation before	14	0	7	5
Dislocation after	5	0	3 stable; 4 unstable	0
Limp at follow-up examination				
Severe	6	3 (bilat.)	3	2
Moderate	6	..	0	6
Slight	3	1	..	5
Present but not described	4	..	..	1
Not stated	1	..	..	1

to jeopardize the stability that was later obtained after upward growth or ascension of the femur.

Pain: Two patients complained of pain before operation and four after. Two of these had pain before stabilization and two had not. The pain at follow-up examination was moderate in one, frequently occurring on beginning to walk, slight in two when they were roller skating and playing too much football, and so severe in the fourth, a woman of 22, as to necessitate hip fusion three years later. The shelf in this case was quite adequate, but irregularity of articulating surfaces had developed between the femur, the shelf and the ilium. As for the three other patients, who had only slight or moderate pain, the shelf had completely absorbed in two but appeared to be adequate in one.

Motion: Before operation the functional indexes varied from 27 to 100 and averaged 75; at follow-up examination they ranged from 24 to 83, averaging 51.

Shortening: This varied from one-half inch (1.3 cm.) of lengthening in one case, due to accompanying involvement and dislocation of the opposite hip, to 2½ inches (6.3 cm.). The average amount of shortening was 2 inches (5 cm.); 1.7 inches (4.3 cm.) before operation.

Limp: Preoperatively a limp was noted as merely present in four cases, moderate in two and severe in one. At follow-up examination it was described as moderate in four and marked in three. Each of these three patients with a severe limp had 2 inches (5 cm.) or more of shortening, two had pain, and in one the shelf had completely absorbed. In addition, abductor muscle power was markedly weak in two and about 70 per cent of normal in one.

THE FUSIONS

Fifteen patients had hip fusion operations. All had unilateral lesions, and five had dislocations. Four patients had previously had reconstructions, and one had a shelf stabilization later. These procedures had all failed, because of pain in two cases, dislocation and pain in one and severe flexion deformity with fibrous ankylosis in another. The ages of these patients varied from 8 to 41 years and averaged 18. The time between the original infection and operation ranged from three to twenty-two years, averaging twelve.

In only two cases was the infecting organism known, and in both of these it was a pneumococcus. Material for cultures was taken at operation from half the patients, but a growth was not obtained in any instance.

A sinus of eight months' duration was present in one case at the time of operation. Fusion was proceeded with, however, because it was thought that the hip might be tuberculous, but only chronic nonspecific inflammation was found on microscopic examination of tissue specimens. Postoperative drainage occurred in three cases. This was probably caused in two by

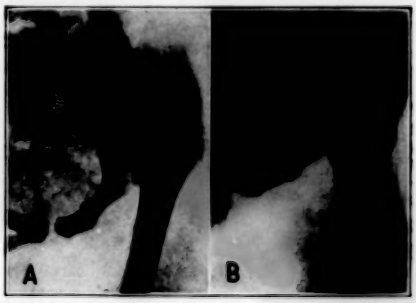

Fig. 8.—Fusion in H. A. V., a girl of 13 years. *A*, before operation; *B*, eleven years after operation. Result: no pain, solid arthrodesis in 45 degrees flexion, 10 degrees abduction and 10 degrees internal rotation, shortening 2 inches and moderate limp.

wound infection. None of the patients had sinuses at follow-up examination.

The presenting complaint was pain in ten cases and stiffness, weakness, severe deformity and marked limp in four others.

The type of fusion operation varied. In nine cases a Hibbs procedure was used in which the anterior two thirds of the greater trochanter and part of the shaft were removed, with or without an attached muscle pedicle, rotated 180 degrees and driven into the ilium

over the bared neck or upper extremity of the femur. Bone chips were also placed about the transposed trochanteric mass, femur and ilium in a few instances. In three cases grafts from the ilium were employed, augmented twice with chips. In two cases fusion was made with suitably placed multiple small bone transplants. In two others direct contact was made between the end

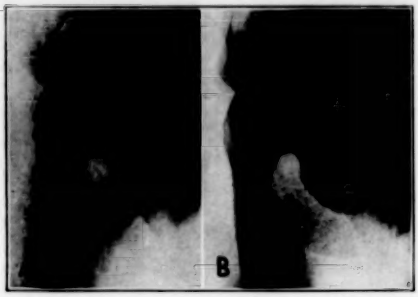

Fig. 9.—Fusion in R. T., a girl of 14 years. *A*, before operation; *B*, six years after operation. Result: no pain, solid arthrodesis in 40 degrees flexion, 10 degrees abduction and neutral rotation, shortening 1½ inches and slight limp.

of the femur and the acetabulum or ilium. Bone chips were also used in one of these and a steel nail for fixation in the other.

In half of the cases, cartilage and bone were removed from the inner or superior portions of the joint in order to secure intra-articular fusion as well as arthrodesis through the grafts. Any resulting space was usually filled in with bone chips.

In general, walking in plaster was permitted at three months; as soon as clinical and x-ray examinations indicated that the arthrodesis was secure enough, plaster support was discontinued. This took place on the average after six and one-half months.

In each of four cases a subtrochanteric osteotomy was subsequently performed in order to obtain proper position. This was necessary in three cases owing to the fact that in each arthrodesis was done in the presenting malposition, for this could not be changed without undue exposure and traumatism with consequent increased risk of reactivation of infection. In the fourth case, in which fusion had failed, osteotomy was performed to relieve a persistent backache due to excessive hip flexion deformity with accompanying exaggerated lumbar lordosis. Rearthrodesis was refused.

Two operations for the removal of necrotic bone chips were necessary in one case, in which the most likely cause of postoperative drainage was a deep wound infection, as culture of the bone at operation yielded no organisms. A fusion was obtained, however, within six months, but sinuses persisted for four years.

Results.—The time of follow-up examination varied from one and one-half to thirteen years and averaged five or seven case years.

Attainment of Fusion: Eleven, or 73 per cent of the patients, obtained fusion by primary operation and four failed to do so. Later three of these had a secondary or refusion operation with success in two and failure in one. The fourth has refused further surgical treatment because the hip has remained painless.

In all, thirteen, or 87 per cent, of the patients have fused joints and are symptomless at the present time.

Pain: Ten patients, or two thirds of the group, had pain before operation; at follow-up examination, only one. This is the case in which refusion failed and a third operation was advised.

Shortening: The average amount of shortening was 1.7 inches (4.3 cm.) before operation and 1.9 inches (4.8 cm.) after.

Limp: Preoperatively a limp was present in every case. It was severe in three cases, slight in one and present but not described in eleven. At follow-up examination two patients had a severe, six a moderate and five a slight limp. In one case it was merely noted as being present; and in another no statement was made. One of the patients with a severe limp did not obtain a fusion and has pain; the other, with solid fusion, has 4½ inches (11.43 cm.) of shortening.

With fusion, the resultant limp, unless shortening is marked or a good position is not obtained, is generally much less than before because pain, instability, abductor muscle weakness and malposition are no longer participating factors. With arthrodesis in good position and without too much shortening, the limp is only slight and not very noticeable.

Optimal Position for Arthrodesis: This has been found to be 20 or 25 degrees of flexion, neutral lateral or 5 to 10 degrees of abduction, depending on the amount of shortening present, and neutral or slight external rotation.

In this series at follow-up examination, the anteroposterior positions varied from 25 to 60 degrees, averaging 35. Severe flexion deformity, over 35 degrees, occurred three times. Ten degrees or more of adduction was found in three cases, internal rotation in three and excessive external rotation in three.

COMMENT

The experience with these relatively small series of cases indicates that reconstructive procedures in children generally result in control of dislocation and painless hips but with considerably limited ranges of mobility (table 4). Absence of pain, however, may not be permanent; for as these patients reach adult age

Fig. 10.—Failure of reconstruction and shelf stabilization and subsequent successful arthrodesis in E. M. The reconstruction operation was performed at the age of 12 years for a painful dislocated hip. The trochanter was transplanted downward, and the end of the shaft was shaped and placed in the acetabulum. Dislocation and pain recurred, and seven years later a shelf was turned down from the ilium. Severe pain continued, and three years subsequently an arthrodesis was performed with complete relief of symptoms. *A*, seven years after reconstruction operation and just before shelf stabilization. *B*, three years after shelf stabilization and just before arthrodesis. Considerable irregularity of articular surfaces existed between femur, shelf and ilium, which undoubtedly contributed to the production of pain. *C*, three years after arthrodesis. Result: solid fusion in 35 degrees flexion, 10 degrees abduction and neutral rotation and shortening 2 inches. The patient walks long distances.

pain will probably develop in many because this type of operation does not produce a very good joint mechanically. The arthroplasties accomplish this much better, but unfortunately many of the patients do not have

enough residual bony structure for this type of plastic procedure.

Well constructed and well placed shelves, unless absorption ensues, will provide dislocated hips with stability and fairly good ranges of motion. They will also check possible progressive ascendancy of the femur on the ilium with consequent increased shortening. Unless considerable irregularity of joint surface develops between femur, shelf and ilium, these hips should remain practically painless in adult life, but because of shortening and abductor muscle weakness, the patients will probably have marked limps.

It is the fusions, however, that can be relied on to provide stable hips free from pain and without marked limp unless a poor position is obtained or there is too much shortening. The best results are secured with unilateral involvement; but even when it is bilateral fusion may be indicated in combination with a mobilizing procedure on the opposite side in order to assure the patient of at least one painless and stable hip.

The previous presence of suppuration does not seem to be an absolute contraindication to a mobilizing procedure, but persons showing a marked proclivity to overgrowth of bone or evidence of considerable previous osteomyelitic involvement of juxta-articular bone which would have to be extensively opened at operation should probably not have a reconstruction or arthroplasty because of the prospect of further overgrowth of bone or reactivation of dormant bone infection. Fusion, if not already present, would be more advisable in such cases.

In deciding on a mobilizing operation, careful case selection should be made. For example, patients whose periarticular structures have become extensively scarred or whose muscles have been inactive following a long-standing ankylosis of the joint are not good subjects for procedures designed to secure or enhance motion. Probably very little movement can be maintained, and failure will result. Arthrodesis is again the operation of choice unless a mobilizing procedure is made mandatory by bilateral involvement, in which event the increased risk of failure must be accepted.

The time of operation is of great importance. It is advisable to wait at least two or three or even several more years after the cessation of all drainage or other evidence of activity.

Finally it must be emphasized that the only way to decrease the number of unfortunate persons requiring reconstructive and stabilizing surgical procedures because of the ravages of suppurative arthritis is to make an early diagnosis and to drain the joint immediately and adequately. The diagnosis must usually be made clinically, as x-ray changes in the bone are late and cannot be awaited. If the diagnosis is in doubt, an exploration with negative results is far better than to allow undrained pus to produce more and more involvement of circulation and destruction of bone.

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ABSTRACT OF DISCUSSION

DR. J. ALBERT KEY, St. Louis: Every reconstruction operation is a subterfuge. One does not know what else to do. I have never seen a reconstruction operation that I liked and the same is true here. I believe that a great many of these patients would have been a lot better off with a subtrochanteric osteotomy and no surgery on the hip joint. Preliminary traction should be given before a shelf operation is done. I realize that in old septic hips there is so much fibrous tissue that one cannot do much with traction; on the other hand, a preliminary loosening up can be followed by wire traction and then placement of the shelf and postoperative treatment in a plaster cast, leaving the wire in the femur and fixing it in the cast in order to hold it down. The reason shelves absorb is because they do not function. The shelf does not have to be very large but it must be in the right position. If it is in the right position it will tend to increase in size. Arthroplastics are not good operations in children or even in adolescents. With the Smith-Petersen cup, of course, the whole question of arthroplasties is going to have to be reconsidered. We won't know the answer for some years. It is possible that later on by means of this new principle it may be possible to get satisfactory results in children. I have not had satisfactory results in arthroplasty of the hip in adults. I have not done them except in bilateral cases. I do not like the index of function based on the movement of the hip. The least important quality of the hip is movement. The most important quality of the hip is stability, the next is absence of pain, and finally comes the question of movement. I was struck by the fact that Dr. Hallock considers the straight position the ideal position. We are gradually getting away from the old idea that we want our hips abducted when we do an arthrodesis and are immobilizing our hips nearly in the straight position. I am pleased to have Dr. Hallock advise early operation in acute pyogenic infection of the hip. There is a great tendency to let the patient battle with the disease and then drain the abscess after an equilibrium has been established between the patient's resistance and the virulence of the organism. I believe that with an acute pyogenic infection of the hip joint it is better to operate early when one suspects the disease than it is to wait until one is sure that the disease is there and the joint is destroyed. It must not be forgotten, either, that we have all seen patients die of pyogenic infection who have not been operated on.

DR. FRANK D. DICKSON, Kansas City, Mo.: The problem of restoring to satisfactory use a hip joint damaged in childhood or adolescence by suppurative arthritis is a very complex one. This is demonstrated by the fact that four different procedures were carried out for this purpose at the New York Orthopaedic Hospital. In the hip joint instability and deformity are responsible for most of the disability, and these two factors must be overcome if a satisfactory weight bearing extremity is to be anticipated. The preservation of a useful amount of motion in the hip joint is highly desirable, and in bilateral involvement imperative but sacrificing stability and satisfactory alinement in favor of limited and often unusable motion is never wise. The series reported by Dr. Hallock indicates that, while many excellent results were obtained by arthroplasty and shelf operations, by far the most satisfactory cases in the series are those in which an arthrodesis was performed, the reason being that, by arthrodesis, stability was provided and a proper alinement secured, so that weight bearing could be satisfactorily carried out. My experience with reconstruction operations and shelf operations in hip joints damaged by suppurative arthritis parallels that reported by Dr. Hallock. The unreliability of the results in plastic operations has convinced me that, in the management of such joints, fusion is by far the most dependable operation. Attempts to preserve motion in a hip joint damaged by suppurative arthritis often interfere with the primary objective of securing stability and satisfactory alinement. Procedures aimed at securing a movable hip joint should be reserved for selected cases. The obstacles to success in the usual case are four: 1. Most of these hips are in a position of pathologic dislocation and show a marked tendency to return to this position after operation. 2. The extensive destruction which is usually present leaves but little head and neck for reconstructive surgery. 3. The extensive fibrosis of the periarticular structures present usually reproduces itself after operation, often to a greater extent than before, and interferes with the establishment of satisfactory motion. 4. It is difficult to build up muscle control of the joint, owing to atrophy and fibrosis of the muscles which control the movements of the joint. There is perhaps something more encouraging in the future.

DR. EDWIN W. RYERSON, Chicago: Many of these suppurative arthritides occur in early infancy. They used to be called the acute epiphysitis of infancy. In many of the cases which

I have seen the entire head and neck were absorbed and disappeared and there was nothing left but the straight shaft with the trochanter playing up and down on the side of the ilium, producing a great deal of instability and but little pain. A good deal of shortening occurs in such cases, and years ago, soon after Lorenz's bifurcation operation was brought out, I began doing a high Lorenz bifurcation of the upper end of the femur, and the results were highly satisfactory because good stability and good motion were attained. It has recently seemed possible that the Colonna operation of denuding the upper end of the greater trochanter from its muscle attachments and placing the upper end of the trochanter in the acetabulum might produce more lengthening than is obtained by the other methods, and a good deal of motion. I am greatly in favor of having some motion in the hip joint if one can possibly get it when it can be combined with stability and painlessness. So I am willing to take chances on making painless and movable hip joints in individuals of reasonable age, because one can always perform an arthrodesis of the hip joint as a last resort. I appreciate Dr. Hallock's paper and I think it covers an important field, although nowadays one does not seem to observe so many cases of suppurative arthritis as were seen fifteen or twenty years ago.

SOME PECULIARITIES IN THE GEOGRAPHY OF CANCER

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AND
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In discussions of the relationship of climate and geography to health, attention has been especially directed toward communicable diseases. This perhaps is to be expected, since these are the diseases against which most control measures have been directed. Geographic variations in the prevalence of conditions due to other possible factors, however, have not been overlooked. Of particular interest with respect to cancer is the fact that Dr. John S. Billings pointed out the wide geographic variation in cancer mortality as revealed by the United States Census of 1880 (fig. 1). Although the data were admittedly incomplete, they indicated that cancer most frequently occurred among persons living in the states extending from New England to the Great Lakes and in the Pacific Coast states.[1]

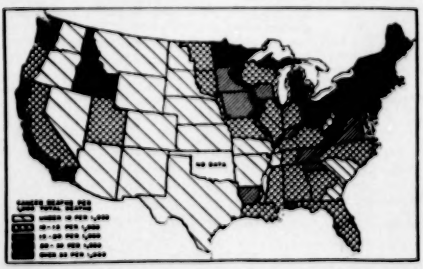

Fig. 1.—Number of deaths from cancer per thousand deaths from known cause, 1880.

Among the items taken up for study by the United States Public Health Service after the passage of the National Cancer Institute Act of 1937 was the distribution of cancer in the population. Two sources of data were used: certificates of death and reports of cases under treatment. Partial figures presented on this occasion are taken from more extensive material.[2] The term "cancer" as used in this paper includes new growths of all types having inherent malignant characteristics. Mortality data will be presented first. These were obtained from basic tabulations of the Vital Statistics Section of the Census Bureau, which show greater detail than the annual reports on mortality statistics.

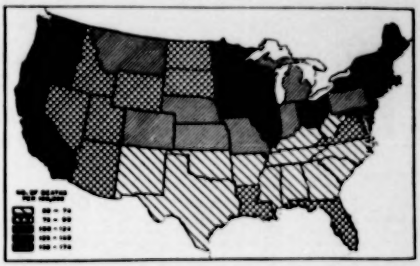

Fig. 2.—Number of deaths from cancer per hundred thousand of total population by states, 1937.

Crude death rates from cancer vary widely through the country (fig. 2). The extreme situations may be cited to illustrate this point. In Rhode Island, 156 persons per hundred thousand of total population died of cancer during 1937, as contrasted with the corresponding rate of fifty-two for South Carolina. In other words, three times as many people, in relation to the total population, succumbed to cancer annually in the state of highest as compared with the one of lowest experience.

Although these two states have been singled out as representing the extremes, differences only slightly less in magnitude exist among other states and groups of states. The experience of New York and of New England is between two and three times that which obtains in the South. The states around the Great Lakes and bordering the Pacific Ocean also have rates well above the average for the entire country.

Certain obvious explanations for these variations immediately come to mind, and no doubt these are operative in some degree. Aside from a few notable exceptions, states with the highest rates have populations that are largely urban; consequently they may be expected to have available superior facilities for diagnosis. Moreover, the states with the lowest death rates from cancer are also states where an appreciable proportion of the deaths are certified as being due to senility and other vague or ill defined causes. If

From the National Cancer Institute and the Division of Public Health Methods, National Institute of Health.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

1. Billings, John S.: Report on the Mortality and Vital Statistics of the United States, as Returned at the Tenth Census, Washington, D. C., Government Printing Office, 1885.

2. Gover, Mary: The Trend in Cancer Mortality, Original Registration States 1900-1936, Public Health Bulletin, to be published; Distribution of Cancer Mortality in Continental United States, 1936, ibid., to be published. Mountin, Joseph W.; Dorn, Harold F., and Boone, Bert R.: The Incidence of Cancer in Atlanta, Georgia, and in Surrounding Counties, Pub. Health Rep. 54:1235 (July 14) 1939; similar data for other areas, to be published.

more specific diagnoses were obtained, it is possible that some of these deaths from indefinite causes would be attributed to cancer, although the larger number probably result from diseases of the heart and arteries, disorders of the kidney and other common ailments of the aged. It is not believed that varying degrees in specificity and accuracy of diagnosis would account

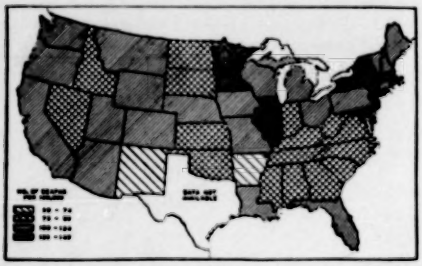

Fig. 3.—Standardized death rate from cancer per hundred thousand of population, 1937.

for more than a small percentage of differences in mortality rates.

A more important factor likely to affect the crude death rate is the diversity in the composition of the population among the states. The usual method of taking account of differences in the composition of the population is to adjust rates to a standard population.[3] It may be appropriate to add a word of caution, to the effect that adjusting for age and race reduces the geographic variation in mortality but does not entirely

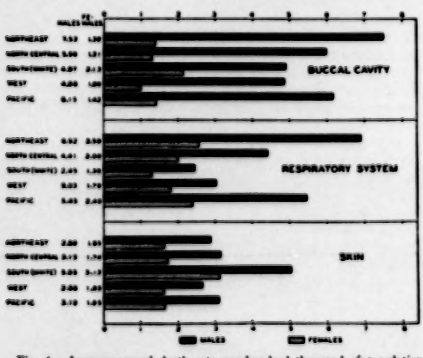

Fig. 4.—Average annual death rate per hundred thousand of population from cancer of the buccal cavity, respiratory system and skin by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

eliminate it. Since the mortality from cancer is less among Negroes than among white persons, the standardized rates for the Southern states are based on the white population only.[4] Rates standardized for age are shown in figure 3.

3. The standard population used is the population of the United States in 1930.

4. The rates refer to the white population in Alabama, Arkansas, California, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee and Virginia.

After age adjustments have been made, the resulting standardized rates in New York and Rhode Island are still twice those in Arkansas and New Mexico, with the general pattern of geographic variation remaining similar to that for the crude rate. It is interesting to note that Louisiana and Florida each occupies a position more than 25 per cent above that in the other Southern states. This may be no more than a coincidence for Florida, a state southern only by location since half of its population were born outside the state; but the data in respect to Louisiana may have significance, as more than 85 per cent of the inhabitants are native to that state.

Mortality from cancer by anatomic sites and by geographic regions is shown in figures 4 to 9. Figures 4 and 5 present data for groups of sites, while figures 6 to 9 show corresponding data for individual sites. These rates also have been adjusted for differences in age composition. Directly opposite to the distribution

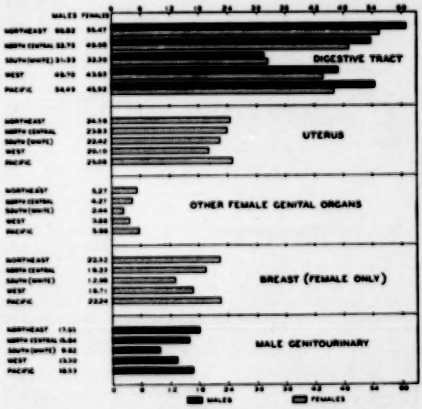

Fig. 5.—Average annual death rate per hundred thousand of population from cancer of certain selected sites by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

of total cancer mortality is that of the skin alone. Lesions of this site claim proportionately more victims, both male and female, in the South as compared with the remainder of the country, but among other regions the difference is of little moment (fig. 4). It has been suggested by some that the higher mortality in the Southern states may result from greater exposure to the sun. However, the Western states, many of which also have a very hot season and relatively more clear weather throughout the year, report the lowest mortality from skin cancer.

Lesions of the buccal cavity show an interesting sex difference in the geographic variation picture. The mortality among males follows the pattern for all cancer, being highest in the Northeast and lowest in the South

5. The states in the five regions are as follows: Northeast: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia. North Central: West Virginia, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri. South: Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Oklahoma, Louisiana. West: North Dakota, South Dakota, Nebraska, Kansas, Montana, Idaho, Utah, Wyoming, Nevada, Colorado, Arizona, New Mexico. Pacific: Washington, Oregon, California.

and West. For females, however, rates are highest in the South, lowest in the West and practically equal in the other regions. The cause of this difference is not apparent. From the standpoint of magnitude, the difference is most pronounced for cancer of the pharynx and mouth although some inequality obtains for each specific site (fig. 6).

While mortality from cancer of the pharynx and mouth is especially high among Southern white females as compared with those of other regions, a high rate is also characteristic of Southern white males. The same statement, however, does not apply to cancer of the tongue, which is less frequent among Southern white males than among males in the Northeast, North Central and Pacific states. Mortality from cancer of the lip shows little geographic variation except for the South, where it is low for males and high for females (fig. 6).

Mortality from cancer of the uterus presents a situation dissimilar from that of other sites in that there

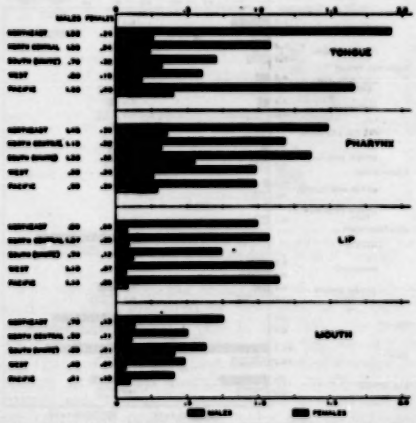

Fig. 6.—Average annual death rate per hundred thousand of population from cancer of the tongue, pharynx, lip and mouth by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

is almost no geographic variation (fig. 5). In contradistinction, the death rate from cancer of the other female genital organs follows the usual geographic pattern. Statements somewhat similar to the latter may be made in respect to cancer of the male genito-urinary system, digestive tract and breast.

Nothing especially important from a geographic standpoint was revealed by the study in regard to malignant conditions of the larynx, lungs and other respiratory organs (fig. 7).

Prostatic malignant change produces a rate that is more than 50 per cent higher in the rest of the country than it is in the South (fig. 8). From this aspect it is similar to mortality from cancer of the kidneys but different from cancer of the bladder, which is highest in the Northeast, North Central and Pacific regions but lowest in the South and West.

Except for the South, cancer of the stomach is universally the most common form of fatal cancer among males, ranking with cancer of the breast and uterus among females (fig. 9). Much the same picture is presented by mortality from cancer of the liver, except that the Pacific Coast states also constitute an area of relatively low rate. The geographic distribution of fatal cancer of the intestines and other parts of the digestive tract is very similar to that already described for all forms of cancer combined.

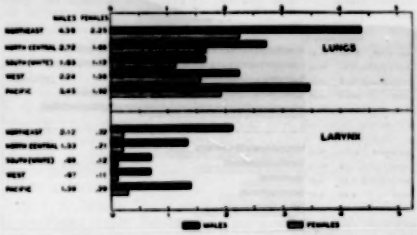

Fig. 7.—Average annual death rate per hundred thousand of population from cancer of the lungs and larynx by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

It is well known that some forms of cancer pursue a more rapid and fatal course than others. For example, cancer of the stomach usually terminates in death shortly after diagnosis, while a person may live for many years and perhaps die of another cause should the skin only be involved. Conclusions, therefore, based on mortality records will differ from those drawn from morbidity reports not only as to the amount of cancer in the population but also in respect to the tissues or organs involved. Furthermore, as therapeutic methods become more effective, the types of cancer most easily arrested will appear less and less frequently in mortality records.

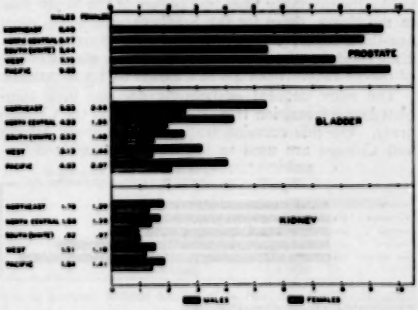

Fig. 8.—Average annual death rate per hundred thousand of population from cancer of the prostate, bladder and kidney by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

Because of these considerations, a number of studies have been initiated by the United States Public Health Service in representative sections to determine the morbidity from cancer and its variation from one part of the country to another, between the two sexes, between white persons and Negroes and at different ages. Field methods used are described in another paper of the cancer statistics series, but it may be well to repeat that the data are obtained directly from physi-

cians, hospitals and clinics and cover patients seen within a specified year (Mountin, Dorn and Boone[2]). Individuals are sufficiently identified to exclude factors of error that might be introduced by residence and duplication of reports.

The several areas chosen for the complete study give representation to the main geographic divisions of the continental United States. Preliminary data for total

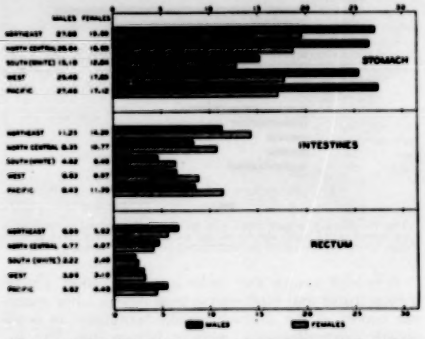

Fig. 9.—Average annual death rate per hundred thousand of population from cancer of the stomach, intestines and rectum by sex in the United States excluding Texas, 1930-1932 (adjusted for differences in age distribution).

cancer have been tabulated for areas [6] centering around Atlanta, Chicago, Detroit, Pittsburgh and New Orleans; these are presented in figure 10. Considerable variation in case rates for cities of the same region may be noted, but the difference between Northern and Southern cities is impressive. The case rates of illness, unlike the mortality rates, are higher in the South than in the North, those for the Southern area being about one-third higher than the rates in the Northern area. Expressed as a ratio of cases to deaths, the incidence of cancer ranges from 2.6 in Chicago to 5.3 in Atlanta.

The more detailed analysis by site has been completed on information from the Atlanta and the Chicago areas. On this occasion bodies of data from Atlanta and Chicago are used to illustrate geographic differ-

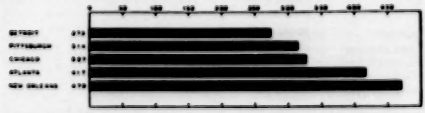

Fig. 10.—Number of cases of cancer per hundred thousand of total population for selected cities, 1937.

ences in the incidence of cancer and to show how figures based on morbidity reports vary from those derived from recorded deaths. When interpreting the figures hereinafter presented, one should remember that regardless of how the incidence of cancer is expressed—whether as the number of cases per death or as the number of cases per unit of population—the estimated figure will depend in great measure on the accuracy of diagnosis, the effectiveness of therapeutic methods and the stage at which the disease is recognized. In any survey of the type described certain cases are missed because of faulty diagnosis or because of their not having come to medical attention, but for all practical purposes it is not possible to obtain information on other than cases of diagnosed cancer. As a consequence, the number of cases of cancer referred to in this paper really represents the number of unduplicated persons with diagnosed cancer who came to the attention of a physician, hospital or clinic during the calendar year previous to the survey.

In a community where a high proportion of diagnoses are unduly delayed, the recorded number of cases may be only slightly greater than the recorded number of deaths. For example, if each patient lives just one year after a positive diagnosis, the case rate in any given year will be equal to the mortality rate of the following year. On the other hand, if each person with

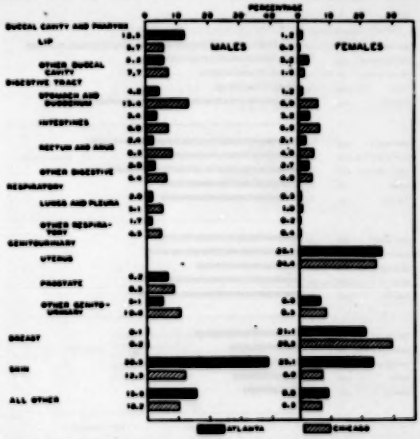

Fig. 11.—Percentage of reported cases of cancer by primary site and sex for white persons in Atlanta, Ga., and Chicago, 1937.

cancer should live, on the average, five years after diagnosis, the incidence rate at any time will be five times the mortality rate five years later. While the effect of delayed diagnosis cannot be entirely eliminated, an attempt has been made to minimize its influence by undertaking the study only in areas having superior medical, hospital and clinical facilities that are reasonably accessible to all groups of the population.

The higher case rates of illness from cancer in the South arise, in part at least, from a higher incidence of skin cancer (fig. 11). Nearly two of every five cases of cancer among white males reported in Atlanta affected skin as compared with one of eight in Chicago. For white females the proportions, although smaller, show about the same relative difference, 23 per cent in Atlanta and 7 per cent in Chicago. Similarly cancer of the lip in relation to all forms was reported twice as frequently for white males and four times as frequently for white females in Atlanta as compared with Chicago. These two types of lesions made up 57 per cent of all cancers among white males and 24 per cent

6. The Atlanta area includes the following counties of Georgia: Cherokee, Clayton, Cobb, Dekalb, Douglas, Fayette, Forsythe, Fulton, and Burnett, Cook County, Ill.; Wayne County, Mich.; Allegheny County, Pa., and Orleans Parish, La., comprise the areas respectively designated as Chicago, Detroit, Pittsburgh and New Orleans.

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of all cancers among white females in Atlanta but only 27 per cent and 7 per cent, respectively, in Chicago.

On the other hand, the digestive tract and the respiratory system were reported as sites more frequently in Chicago than in Atlanta, the corresponding percentages being 45 for white males and 23 for white females in Chicago as compared with 16 for white males and 10 for white females in Atlanta.

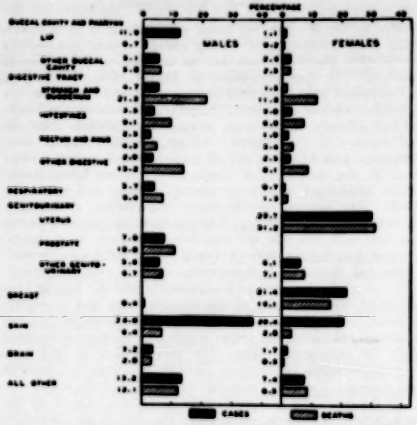

Fig. 12.—Percentage distribution by primary site and sex of reported cases of cancer and recorded deaths from cancer in Atlanta, Ga., and surrounding counties, 1937. (The deaths are for the state of Georgia.)

For specified sites the occurrence of cancer varied markedly when measured by morbidity as compared with mortality reports (figs. 12 and 13). In some measure this may arise from the fact that tumors of one type are more malignant than those of another or because of varying susceptibility to treatment. In Atlanta cancer of the skin, to which is attributed 37 per cent of all cases among males and 20 per cent among females, accounts for only 6 per cent of the male deaths and 3 per cent of the deaths among females. On the other hand, malignant tumor of the digestive tract, which causes nearly 50 per cent and 30 per cent, respectively, of all male and female deaths from cancer, is reported about one-fourth as frequently among cancers in living patients for this locality.

In Chicago the same general relationships between cancer in dead and in living patients hold true, although the proportions are quite different. Cancer of the digestive tract is reported as the primary site for 55 per cent of the fatal tumors but for 35 per cent of the tumors in living patients among males; the corresponding figures for females are 42 and 20, respectively. The rectum and anus are the only tumor sites in the digestive tract reported as frequently among tumors in living as among those in dead patients.

No attempt has been made in this paper to do more than point out the existence of geographic variations in the occurrence of cancer. That such variations exist, there can be no doubt. The explanation of these differences must await further investigation into the causes of cancer. However, the existence of significant differences not only in the total amount of cancer but also in the types of lesions indicates that contributory factors, perhaps multiple and varied, may be found in the environment.

ABSTRACT OF DISCUSSION

E. V. Cowdry, Ph.D., St. Louis: This paper is a concise report on the beginning of a systematic, large scale analysis of the factors for and against cancer. To distinguish the geographic ones from the others is difficult. The authors have mentioned corrections for age and for standardized population and I hope that they will explain these corrections a little further. There is also the possible factor of race. In the North both white persons and Negroes appear to have been included in these statistics, while in the South the Negroes were not taken into consideration. On the whole it is possible when the groups studied in different parts of the country are selected on the basis of similarity in age, race, economic status and other factors that the striking differences in cancer incidence described will be reduced.

Dr. J. N. Baker, Montgomery, Ala.: The data accumulated by the Public Health Service under the direction of Dr. Mountin seem to confirm amply the frequently observed fact noted by Southern clinicians that there is considerable predominance of cancer of the skin among the white population of the South, which predominance is even more marked in the rural portion of its population. On the other hand, the Negro, whose body is probably even more exposed to the sun's rays, appears to be nothing like so susceptible to the development of cutaneous cancers. His skin pigmentation, no doubt, is accountable at least in part for such immunity. Such a thoroughgoing, comprehensive study in the cancer field is badly needed and, when completed, should place at our disposal a wealth of useful information.

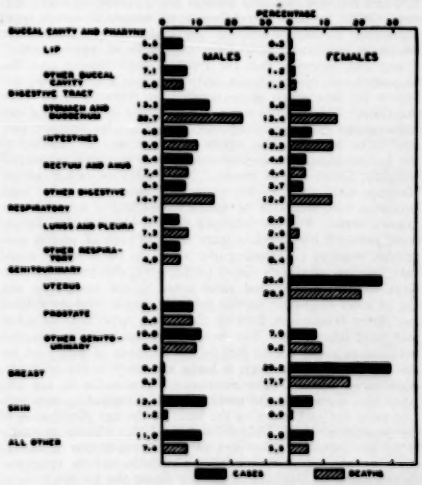

Fig. 13.—Percentage distribution by primary site and sex of reported cases and recorded deaths from cancer in Cook County, Ill., 1937.

Dr. Frederick G. Murray, Cedar Rapids, Iowa: This study of the geographic distribution of cancer is most interesting. One point about bright sunlight and the prevalence of skin cancer is the matter of exposure. The incidence of cutaneous cancer in southern California is considerably less than in other Southern states. There is the same brilliant sunlight in southern California as in other parts of the South; the low incidence

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of cutaneous cancer in California may be due to the comparative lack of exposure of the white population there to the sunlight. In California the rural outdoor work is done almost exclusively by the Oriental and Mexican laborer, whose pigmented skin protects him from the effects of sunlight. In the other Southern states a much larger proportion of the white population engages in outdoor field labor and is correspondingly more exposed to sunlight, thus accounting for the greater prevalance of cutaneous cancer in these other Southern states.

DR. JOHN A. FERRELL, New York: I wish to inquire if this paper is to be the first of a series, so that later factors will be treated that were not discussed here. It is presumed that comparisons of groups by age will be made. Might not the recognized high average age of the population in New England and California account in part for their high cancer mortality? Is not the cancer rate notably high in particular racial groups? Does not occupation exert an influence on rate? In computing cancer rates, I wonder how the authors arrived at their population basis. If the 1930 census is employed, considerable change may have occurred in certain communities during the past nine years and might account for some variation.

DR. A. G. HENDERSON, Imboden, Ark.: I have two questions to ask: Has cancer increased greater in the last twenty years than the population of the United States? What effect has the treatment of cancer had in reducing the mortality in the last twenty years?

DR. JOSEPH W. MOUNTIN, Washington, D. C.: To answer many of the questions raised in the discussion would require data of a different type than those on which this study was based. Our data were limited to a few items such as residence, age and sex of the patient and site of the cancer. These were obtained through mortality records and a special incidence survey. With but few exceptions each report of cancer used represents a diagnosis by a physician. For administrative reasons it was necessary to limit the number of questions asked. I may add, however, that the Public Health Service now has in progress an epidemiologic study of cancer involving the collection of data much more detailed in character than those described. This epidemiologic study is being done in connection with several well organized cancer clinics. Its primary purpose is to determine the significance that may be attached to the various clues advanced by clinicians as to factors associated with the occurrence of cancer. No figures on cancer among Negroes were used in the paper we have presented. Such exclusion was necessary to insure comparability between geographic areas. For the incidence portion of our study, figures were gathered from certain large cities in each of several geographic regions. Extending the study to rural areas would have entailed very high costs; furthermore, differences between large medical centers and rural areas in the availability and use of good diagnostic service probably would have invalidated any direct comparison between the cancer experience of urban and rural inhabitants. The factor of occupation in connection with cancer could not be assayed on the basis of data used for this paper. This, however, is being attempted in the epidemiologic study which I have mentioned. The factor of age was taken into account by the usual method of computing standardized rates for each state on the basis of the age distribution of the population of the United States in 1930. Cancer mortality is on the increase. The part of this increase that is due to changing age composition of the population can be estimated. Improvement in diagnosis is another factor but its effect varies with the character of local facilities and the site of the cancer.

DR. FERRELL: Did you take the occupational factor into consideration?

DR. MOUNTIN: No. We had to choose between what we could get and what we would like to get. We made our questionnaire. We sent it around. If it had been too extensive we should have had difficulty in getting it filled out and, furthermore, occupation is a difficult thing to classify. You have to get down much beyond the mere gross classification of population and get into exposure to different irritants and other factors that might have something to do with the causation of cancer. We are doing that in our epidemiologic study, but those data are not in the incidence study on which we have just reported.

Clinical Notes, Suggestions and New Instruments

CHEILITIS, FIXED DRUG ERUPTION AND GASTROINTESTINAL ALLERGY FROM EOSIN DYE OF LIPSTICK

RUDOLPH HECHT, M.D.; B. Z. RAPPAPORT, M.D., AND LEON BLOCH, M.D., CHICAGO

Mrs. P. W. W., aged 43, white, was referred to us in March 1936. She complained of itching eyelids, scaling and redness of the skin about the eyes and an eruption at the corner of one eye. The symptoms began in August 1934. The itching had persisted since then with exacerbations and remissions. A physician advised the use of "nonallergic" cosmetics and prescribed solution of potassium arsenite and calcium. She did not improve on this regimen; in fact, her skin became more irritated. One of us (L. B.) diagnosed gastrointestinal allergy in 1935, the symptoms of which were frequent bowel movements (composed largely of mucus), cramps and pencil-like stools. The physical and laboratory examinations at that time revealed no abnormalities. The information obtained during her first visit was that she was using perfumes, toilet waters, talcums, face powder, various creams, liquid nail polish, "henna," rouge and lipstick. On examination the following was noted: The skin of the face showed generalized erythema. On the area adjoining the outer side of the left eye there was a slightly elevated, roughly triangular, peanut sized, lichenified plaque, of dusky red violaceous color, which was sharply demarcated from the surrounding skin. The skin in back of both ears was erythematous and scaling, while the lips were dry, fissured and scaling. There was moderate dry scaling of the scalp.

At the first visit cosmetics were suspected. Therefore the patient was advised to discontinue the use of all cosmetics. Intracutaneous tests were made with all the common foods in an attempt primarily to discover the cause of the gastrointestinal symptoms. These tests all gave negative results except for a questionable reaction to banana, which clinically proved to be of no significance.

After avoidance of cosmetics for one week it was noted that the redness of the face had subsided and that the skin behind the ears was now completely clear. Also, to our surprise, the abdominal distress had completely subsided. At this visit she begged to be allowed "at least the use of lipstick," since she was unable to go among her friends "looking like a ghost." Two days after the resumption of the use of lipstick the eruption at the corner of the eye and the abdominal distress reappeared. Patch tests were then made with all the cosmetics that had been used. The lipstick gave a 4 plus reaction with erythema, edema and severe vesiculation. In order to explain why no improvement had occurred when the "nonallergic" cosmetics had been used, a patch test was made with the "nonallergic" lipstick. This also gave a 4 plus reaction. Samples of the constituents of this lipstick were obtained from the manufacturer and were used for patch tests. All were negative except for brom acid (tetrabromofluorescein), which gave a 4 plus reaction. The old sites of patch test reactions flared up after this reaction.[1] Erythema of the face in the areas of the previous cutaneous eruption occurred with the positive cutaneous reaction on the arm.

Various bromofluoresceins and other dyes commonly used in lipsticks were supplied to us by the Ar-Ex Cosmetic Company, Inc. Patch tests with these dyes were negative except for the tetrabromofluoresceins. A lipstick prepared by this company containing no "indelible" dye was negative on patch test. The patient has for the past three years used "nonindelible" lip rouge and has resumed the use of all other cosmetics and perfumes with no recurrence of the cutaneous or gastrointestinal symptoms. No dietary restriction has been necessary. The disappearance of the gastrointestinal symptoms was particularly

From the Department of Physiological Chemistry, University of Illinois College of Medicine, and Michael Reese Hospital.

1. Stauffer, H.: Die Ekzem Proben, Arch. f. Dermat. u. Syph. **169**: 517, 1931.

interesting. During the past three years we have attempted several times to induce her to try the ingestion of capsules containing a small amount of tetrabromofluorescein. We were interested in knowing whether the gastrointestinal symptoms and the eruption would return. She has, however, refused to swallow any of the dye, preferring to "let well enough alone."

The interesting facts indicated by this study are the presence of cheilitis, a patch of dermatitis of the "fixed" type and of gastrointestinal symptoms. The elimination of the bromofluorescein dye from the lipstick resulted in the disappearance of the symptoms. There has been no recurrence for the past three years. We believe it is probable that the cheilitis was a contact dermatitis due to the tetrabromofluorescein dye in the lipstick. That these dyes can cause this type of dermatitis is well known. The role of this substance as an etiologic factor in lipstick dermatitis has been thoroughly studied by Sulzberger and Goodman.[2] That it was the causative factor in our case was proved by:

1. Positive patch test with the lipstick.

2. Positive patch test with the tetrabromofluorescein used in the manufacture of the lipstick.

3. Negative patch tests with the other ingredients of the lipstick.

4. Improvement of symptoms when the use of lipstick was stopped.

5. Return of symptoms when the lipstick was again used.

6. Negative patch tests with a lipstick free from tetrabromofluorescein.

7. Complete clinical relief for a period of three years after substitution of such a lip rouge.

The peculiar patch of dermatitis near the eye was not characteristic of a contact type dermatitis, although the dye could have been carried there by the fingers. However, if this lesion near the eye was the result of dye carried there by this means it is difficult to understand why the eruption was limited to such a small area rather than involving the eyelids, which are more commonly affected by such contact. It is possible that this site was an area of local sensitization. Since this patch was sharply circumscribed, did not contain vesicles, was violaceous, disappeared on removal of the offending agent from the lips and reappeared when the lipstick was reapplied to the lips, it may possibly have been a lesion of the fixed drug eruption type due to the ingestion of the eosin dye.

We know of no reported case of such an eruption due to this dye. Unfortunately we were unable to feed the dye and observe the effects. Sulzberger and Wise,[3] Abramowitz [4] and Abramowitz and Noun [5] have thoroughly studied fixed drug eruptions due to phenolphthalein. Similar eruptions have been reported due to antipyrine, allurate and arsphenamine.

The gastrointestinal symptoms were especially interesting and may be of importance in explaining other obscure cases of vague gastrointestinal symptoms frequently complained of by women.

Various substances of relatively simple structure (i. e. not proteins) are capable of causing gastrointestinal allergic symptoms.[6] It is possible that these substances act as haptenes and take on the character of full antigens by union with body proteins, as suggested by Wolff Eisner in 1907. In fact, the recent work of Rosenthal [7] with phenolphthalein in which he believes he has demonstrated in vivo union of haptene to protein may be significant in this regard.

2. Sulzberger, M. B.; Goodman, Joseph; Byrne, Loretto A., and Malhazi, Ella D.: Acquired Specific Hypersensitivity to Simple Chemicals: II. Cheilitis with Special Reference to Sensitivity to Lipstick. Arch. Dermat. & Syph. 37: 597 (April) 1938. Sulzberger, M. B., in discussion on Feldman's case, Arch. Dermat. & Syph. 37: 860 (May) 1938.

3. Wise, Fred, and Sulzberger, M. B.: Drug Eruptions: I. Fixed Phenolphthalein Eruptions, Arch. Dermat. & Syph. 27: 349 (April) 1933.

4. Abramowitz, E. W.: Reactions Due to Phenolphthalein: A Study of Their Pathogenesis, Arch. Dermat. & Syph. 31: 777 (June) 1935; Role of Allergy in Drug Eruptions, New York State J. Med. 37: 128 (Jan. 15) 1937.

5. Abramowitz, E. W., and Noun, M. H.: Fixed Drug Eruptions, Arch. Dermat. & Syph. 28: 875 (May) 1933.

6. Rowe, A. H.: Clinical Allergy, Philadelphia, Lea & Febiger, 1937. Kaeminerer, Hugo: Allergische Diathese und Allergische Erkrankungen, Munich, J. F. Bergmann, 1934.

7. Rosenthal, S. R.: The Conjugations of Haptens in Vivo: I. Phenolphthalein, J. Immunol. 34: 251 (March) 1938.

SUMMARY

This case of contact dermatitis, possible "fixed drug" eruption and gastrointestinal allergy was due to tetrabromofluorescein in a lipstick.

The general use of lipsticks containing tetrabromofluorescein or related dyes by American women may explain many obscure cutaneous eruptions, especially of the "fixed" type, and may explain some cases of gastrointestinal disturbances of the nature of spastic colitis or mucous colitis.

25 East Washington Street.

RESISTANCE TO PROTAMINE ZINC INSULIN WITHOUT RESISTANCE TO REGULAR INSULIN IN DIABETES MELLITUS

JAMES A. GREENE, M.D., AND O. D. THATCHER, M.D.
IOWA CITY

Temporary resistance to insulin in diabetes mellitus is not an uncommon occurrence, but resistance to one type of insulin without resistance to another is rare. It is for this reason that we are reporting a case in which there was resistance to protamine zinc insulin and not to regular insulin.

REPORT OF CASE

A white woman aged 27, single, entered the University Hospital Aug. 3, 1938, because of an acute inflammation of the left external ear and diabetic acidosis. Diabetes mellitus had been present for eleven years and had been treated haphazardly with insulin and modifications of the diet. Growth ceased shortly after the appearance of the diabetes, and the secondary sex characteristics did not develop nor did menstruation occur. For six months prior to admission the diabetes became more severe and was not adequately controlled, although more vigorous treatment was instituted. A furuncle developed in the left external auditory canal three days before admission, and the infection spread to the auricle. The patient lapsed into coma and was sent to the hospital immediately.

Doses of Insulin, Potential Intake of Dextrose and Amount of Glycosuria

Date	Potential Dextrose	Regular Insulin	Protamine Zinc Insulin	Urine Dextrose 24 Hours
9/12/38	170	25, 5, 15, 15	0	0
9/13/38	170	25	45	86
9/14/38	170	25	45	87
9/15/38	170	25	45	68
9/16/38	170	0	45	71
9/17/38	170	0	45	75
9/18/38	170	0	45	52
9/19/38	170	0	45	90
9/20/38	170	0	45	110
9/21/38	170	0	30 15	110
9/22/38	170	0	30 15	122
9/23/38	170	0	30 15	130
9/24/38	170	0	30 15	83
9/25/38	170	0	30 15	105
9/26/38	170	0	30 15	145
9/27/38	170	0	30 15	160
9/28/38	170	0	30 15	142*
9/29/38	170	25, 5, 15, 15	0	27
9/30/38	170	25, 5, 15, 15	0	10
10/ 1/38	170	25, 5, 15, 15	0	0

* Carbon dioxide combining power 26 volumes per cent.

The patient was small, thin and underdeveloped and appeared to be about 16 years of age. She was in a semicomatose condition. The left external ear was acutely inflamed, with pus exuding from the canal. Large amounts of dextrose and acetone were in the urine. The blood sugar concentration was 367 mg. per hundred cubic centimeters and the carbon dioxide combining power was 17 volumes per cent.

The acidosis was controlled by the administration of dextrose and regular insulin. The infection subsided after incision of the left auricle. The diabetes was finally controlled with insulin in doses of 5 units at midnight, 25 units before breakfast, 10 units at noon and 20 units before supper, and a diet of three meals daily containing 170 Gm. of potential dextrose.

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Elimination of the midnight dose of insulin or alteration of the time of administration resulted in moderate to extreme glycosuria. The regimen was changed, therefore, to four meals daily, at 7 a. m., 11:30 a. m., 5 p. m. and 10 p. m. Insulin was administered before each meal in doses of 25, 5, 15 and 15 units. The glycosuria was controlled for approximately two weeks before protamine zinc insulin was substituted for regular insulin. It is to be noted from the table, which shows the doses of insulin, potential intake of dextrose and amount of glycosuria, that the protamine zinc insulin was ineffective and that acidosis developed. The return to regular insulin in the previous doses promptly controlled the glycosuria by the third day. Another attempt (twenty-eight days later) to use protamine zinc insulin in daily doses of 90 units resulted in a glycosuria of from 30 to 33 Gm. daily. This glycosuria subsided when regular insulin was again administered. Positive reactions followed the intradermal injections of protamine zinc insulin in this patient, whereas negative reactions were obtained in other diabetic patients; also this patient failed to react to regular insulin thus administered.

COMMENT

We have been able to find only one report in the literature of resistance to protamine zinc insulin without resistance to regular insulin. John's[1] patient had hemochromatosis, but there was no evidence of this malady in our case. The cause of such resistance is not clear. That the protamine zinc insulin was active was shown by the fact that another patient received insulin from the same vials and her diabetes was controlled. The protamine zinc insulin appeared to be absorbed, as evidenced by the absence of masses beneath the skin at the sites of injection. It is generally believed that protamine zinc insulin is retained at the site of injection, and this is supported by the observations of Allen.[2] It appeared probable, however, that the protamine zinc insulin was transported to some other site in the body in our patient and some may have been excreted by the kidney. It is for this reason that several twenty-four hour specimens of urine were examined for protamine and for insulin, but neither was demonstrable in any of the specimens. The failure to liberate the insulin in our patient may have been due to the allergic reaction which altered the protamine and thereby prevented it from being broken down in the usual manner. The positive reaction to intradermal injections of protamine zinc insulin in our patient would support such a contention.

SCIATIC NERVE PRESSURE FOLLOWING RUPTURE AND FIBROSIS OF A HAMSTRING MUSCLE

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This case is reported because no similar case could be found in the literature and because of the exceptional symptoms from a known condition, the failure of the usual surgical repair of a ruptured muscle to relieve symptoms and the excellent result from a final radical procedure.

REPORT OF CASE

A college student aged 21 sustained a traumatic injury to the distal posterior part of the left thigh in football practice in late October 1936. He was indefinite about the exact manner of his receiving the injury as he was beneath a pile-up of players. The traumatized area was treated with radiant heat and light massage for several days. He had pain on walking for the next few weeks but after that he had no trouble in the injured extremity until he entered spring football practice. At that time motions of the left knee seemed difficult to initiate and he had moderate weakness in the entire leg. Also a bulging mass developed in the midline of the posterior part of the thigh about 10 cm. above the superior boundary of the popliteal space. This tumor seemed to be of fibrous tissue, was moderately tender on pressure and was visible and palpable only when the knee was in flexion.

On examination a diagnosis was made of partial or complete rupture of a medial hamstring muscle with fibrosis due to continued use following injury. Through a longitudinal incision the hamstring muscles were exposed in the distal half of the thigh. The semitendinosus muscle was found to have an old partial rupture about 8 cm. above the musculotendinous junction. A mass of tissue, which appeared to be fibrous, filled the gap in the muscle. The tumor was excised, the muscle fibers were brought snugly together with No. 2 chromic interrupted sutures, and the wound was closed in layers. Motion was started at the knee in ten days and full activity was permitted at the end of four weeks.

The patient played football during the autumn of 1937 but was not able to handle the left extremity in a normal manner. He complained of weakness in the knee and inability to make sudden movements at this joint. Late in the season, while doing short practice sprints before a game, he felt a tearing sensation at the operative site. He had marked pain and was forced to walk with crutches for several weeks. He then discovered he had a small mass, moderately tender to pressure, in the lower posterior part of the thigh similar to the one present prior to the muscle repair.

Schematic drawing of the posterior part of the thigh, showing localized fibrosis of the semitendinosus muscle and its relation to the sciatic nerve.

In October 1938 he began work as a lineman with a telephone company. His duties included climbing and remaining on poles for long periods. At this time he began having unusual symptoms in the left leg. After being on a pole for twenty to thirty minutes he would develop a partial paralysis of the left ankle and anesthesia over the lateral and posterior portions of the leg and of the entire foot. When he returned to the ground both the motor and sensory disturbances would disappear immediately on his massaging the leg and passively moving the ankle. These symptoms of sciatic nerve pressure, he noticed, occurred only when the knee was kept in continuous hyperextension for periods longer than fifteen minutes.

He was examined again in late autumn. At that time a definite mass 6 by 4 by 1.5 cm. would appear in the midline of the distal posterior portion of the left thigh on flexion of the knee. There was but slight pressure tenderness. Results of neurologic examination were negative. No pathologic change of bone or joint was demonstrable by roentgenograms. It was believed that the motor and sensory changes of which the patient complained were due to localized fibrosis of the semitendinosus muscle which pressed on the sciatic nerve when the knee was in hyperextension. In such a position the tightened posterior fascia would force the mass laterally and anteriorly against the sciatic nerve. Surgical exploration was advised.

Exposure of the semitendinosus muscle showed a thickened muscle belly about 10 cm. proximal to the musculotendinous junction. The muscle appeared to be under normal tension but the fibers seemed coarser than normal. Since the patient had requested general anesthesia it was impossible to reproduce the exact swelling noted clinically. The tendon of the muscle was released at its insertion and the muscle was excised near its origin. The sciatic nerve was not explored. Motion was started at the knee in ten days and full unprotected activity allowed in six weeks.

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The specimen of tissue examined consisted of the semitendinosus muscle with the attached tendon. The lower third of the muscle, on section, was grayish white and increased in consistency. In some areas strands of firm fibrous tissue almost completely replaced the normal tissue.

Microscopic study showed a large amount of rather dense fibrous stroma which contained numerous small thin-walled blood vessels. In areas this fibrous tissue stroma was so diffuse that only small individual muscle fibers were seen. There was atrophy of the muscle fibers, shown by the loss of staining character, and there was slight breaking up of the nucleus with vacuolation of the cell cytoplasm.

The pathologic diagnosis was extensive fibrosis of the semitendinosus muscle caused by trauma.

The patient has been seen every two or three weeks and has had no recurrence of the nerve pressure symptoms. Motions at the knee are now unrestricted and painless, and the circumference of the left thigh measured 15 cm. above the patella is but 2.5 cm. less than that of the normal right thigh. The power of the left hamstring muscles is now (five months after operation) about 80 per cent normal. The patient walks without a limp and states that he is able to use the knee more efficiently than before the muscle resection.

COMMENT

Conwell and Allredge,[1] Gilcreest [2] and McMaster [3] have made extensive studies on tears and ruptures of muscles and tendons. Gilcreest [2c] reported rupture of the semitendinosus muscle of a man 59 years of age. This patient fell to the ground while lifting some heavy lumber and struck on his left thigh posteriorly. He had pain on standing with the knee extended and on active flexion of the knee, pain about the knee with each step and pain in the lower posterior part of the left thigh when the left leg was crossed over the right knee. At operation, with local anesthesia, a mass the size of a hen's egg was found. This was visible, however, only when the knee was actively flexed. The muscle was also in a relaxed condition. Mattress sutures were used to shorten the muscle. An excellent result was obtained.

The mechanism of a muscle's tearing is of interest. McMaster,[3] in experimental work with ruptured muscles and tendons, concluded that muscles are most frequently ruptured by indirect violence when they are in a contracted state. The muscle belly is torn across or the musculotendinous junction is separated. He found that when a normal muscle with tendon attached is subjected to a severe strain the muscle is injured as just stated or the insertion of the tendon is pulled away. Lexer [4] has pointed out that occasionally a muscle may be ruptured while in a resting state by indirect violence. Direct trauma may produce a rupture, as shown by Montgomery,[5] who had a case in which the triceps was torn transversely owing to a severe blow on that muscle.

The muscle tissue changes following rupture are generally agreed on by pathologists. Boyd [6] stated that a torn or injured muscle is repaired by fibrous tissue and that no new muscle fibers are formed. Blood is poured into the gap and union results from formation of fibrous tissue. Karsner [7] expressed the belief that regeneration of muscle tissue depends on the extent of the injury and the degree of involvement of the perimysium. If the destruction is extensive the muscle buds cannot bridge the gap and the area is filled with scar tissue. Smith and Gault [8] stated that striated muscle, to all intents and purposes, is incapable of actual regeneration. When injury involves muscle cells there is an abortive attempt on the part of the sarcolemma to proliferate.

CONCLUSIONS

1. Fibrous tissue formation is inevitable in the repair of severe muscle tears, treated either conservatively or surgically.
2. The resulting fibrous mass should be given consideration in its relationship to adjacent nerves and vessels.
3. Further efforts to repair the muscle in this particular case would have undoubtedly produced additional scar tissue, with a recurrence of the nerve pressure symptoms.
4. An excellent end result, functionally and cosmetically, has been obtained by complete excision of the semitendinosus muscle.

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Special Clinical Article

PHYSIOLOGY OF THE BILIARY TRACT

CLINICAL LECTURE AT ST. LOUIS SESSION

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The most common complaints for which patients seek medical aid are those referable to the digestive system. The biliary tract ranks high among the abdominal organs which give rise to these complaints. According to a recent report, 24.5 per cent of women and 9 per cent of men over 39 years of age who complain of "dyspepsia" have gallbladder disease.[1] Necropsy records reveal an incidence of gallstones varying from 6 to 32 per cent in the occident; they also reveal an incidence of visible gallbladder disease varying from 50 to 66 per cent.[2] Thus, the frequency of gallbladder disease is such as to emphasize the importance of a clear understanding of the normal and applied physiology of the organ and the ducts with which it connects.

Since on previous occasions the physiology of the gallbladder and the sphincter of Oddi have been rather completely reviewed,[3] this paper will deal chiefly with some of the more recent advances of practical import. (Space permits the citation of only a few references in this synoptic review.)

THE GENERAL FUNCTIONS OF THE GALLBLADDER

The evidence indicates that the gallbladder has two general functions: It serves as a pressure regulatory mechanism and as a bile reservoir for digestive purposes.[4]

Pressure Regulation.—In man and dog the secretory pressure of the liver amounts to approximately 30 cm.

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of bile pressure. The maximum expulsive power of the gallbladder amounts to from 20 to 30 cm. The usual resistance offered by the "sphincter of Oddi" in man and dog amounts to from 9 to 25 cm., but the sphincter at times may offer as much resistance as 75 cm. of bile pressure. This is an important fact, since all animals that have a sphincter have a gallbladder apparently to prevent back pressure from being exerted on the liver.

Bile Storage.—All animals possessing a liver which forms relatively small quantities of bile, such as man, the dog and the cat, have a gallbladder which, by considerable concentration, from five to ten times, can store the twelve to twenty-four hour output of bile.[5] This concentrated bile, rich in bile salts, is ready to be discharged in response to cholecystokinin, which is produced when fats and acids make contact with the intestinal mucosa.

CHOLECYSTECTOMY AND THE GENERAL FUNCTIONS

When a gallbladder that concentrates bile is removed, a temporary paresis of the sphincter is said to occur. Later the sphincter is thought to recover and to cause the dilatation of the ducts that is usually found in man and dogs after surgical or pathologic cholecystectomy.[6] Studies on man show that complete incompetence of the sphincter after cholecystectomy is not usual.[7] However, a relative paresis may have occurred, since one cannot measure in man the resistance of the sphincter prior to cholecystectomy. Also the sphincter may have already undergone the sequence of paresis and recovery as a consequence of preexisting disease of the gallbladder. Although the actual cause of the dilatation to the ducts has not been established, the change shows that the gallbladder has a function. Further, bilirubinuria will develop sooner in an animal without a gallbladder than in one with a gallbladder when the common duct is obstructed.[8] Direct evidence showing that intestinal digestion is disturbed after removal of a gallbladder that concentrates bile is wanting.[9]

The only established effect of the removal of a gallbladder that concentrates bile is that dilatation of the ducts usually occurs.

THE ACTIVITIES OF THE GALLBLADDER

The activities of the gallbladder are absorption, secretion and motility. These have been discussed adequately in previous papers.[10] A few points deserve reiteration. The acutely inflamed gallbladder does not visualize, concentrate or evacuate. After the acute inflammation subsides, the gallbladder may apparently function normally, subnormally or not at all. A noninflamed gallbladder with a hyperplastic mucosa concentrates exceedingly well. An inflamed gallbladder is capable of absorbing bile salts, and, at times, serum protein and even blood may exude into the lumen. Some of the changes in the activities of the organ occurring in several common disorders are outlined in the accompanying table.[11]

FACTORS CAUSING OR PREDISPOSING TO GALLBLADDER STASIS

Stasis in the gallbladder will predispose to infection and to the formation of gallstones, which in time may cause symptoms. Continued stasis leads to hyperplasia of the mucosa and lymph nodes in the dog.[12] The following factors cause or predispose to gallbladder stasis: (*a*) hypertonicity of the sphincter of Oddi; (*b*) inflammation of the ampulla; (*c*) obstruction or stricture of the common duct; (*d*) duodenal inflammation;[13] (*e*) reversed peristalsis or hypertonicity of the duodenum;[14] (*f*) inadequacy of fats, proteins or fruit juices in the diet; (*g*) narrowing or inflammation of the cystic duct;[15] (*h*) obstruction of the cystic duct; (*i*) hypo-

Gallbladder Bile (Human)[11]

	Absorption	Concentration	Secretion	Visualization	Emptying	Bile Acids
Normal	Water Chlorides Sodium bicarbonate Bile salts (?) (small amounts) Cholesterol (?) (small amounts)	Bile salts Cholesterol Bile pigment Calcium	Mucus (nucleoprotein)	Present	Normal	50% cholic acid 50% noncholic acids
Pregnancy	.....	High cholesterol High chlorides Low bile salts Low calcium	Mucus	Present, distended	Delayed during 2d and 3d trimester	
Obstruction cystic duct	Eventually all constituents of bile absorbed	Calcium pigment high; cholesterol low calculi (when present)	± "White bile" (mucus) "Calcium milk bile"	Absent	Absent	
Damaged gallbladder wall (cholecystitis)	Bile salts; hypertrophic rugae cause good absorption, if not inflamed	High chlorides Low bile salts Low calcium High protein	Increased	Present to faint, or absent	Normal, delayed, or absent	32% cholic acid in chronic cholecystitis; 16% cholic acid in acute cholecystitis

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tonicity of the gallbladder; (*j*) inflammation, fibrosis or obstruction of the gallbladder; (*k*) pregnancy.[16]

REFLEX EFFECTS OF GALLBLADDER OR BILE DUCT DISTENTION

Pain, nausea and vomiting are well known reflex symptoms in biliary colic. Inspiratory distress is reported in 25.5 per cent of patients with chronic cholecystitis and in 31.8 per cent when associated with jaundice.[17] Impaction of a stone in the cystic duct is said to be especially prone to cause respiratory distress. It is now known that a rather sudden elevation of pressure in the gallbladder or ducts will cause pain, nausea and vomiting in man and the dog. The right half of the diaphragm is relatively fixed and shows a limitation of motion. The pain is abolished by section of the splanchnic nerves and the nausea and vomiting by section of the vagi.[18] To abolish completely the associated respiratory disturbance, section of both sphlanchnics and vagi is required. Anorexia may occur in disease of the biliary tract. It is known that mild distention of the biliary tract will inhibit hunger contractions and diminish the tone of the stomach, which probably accounts for the anorexia.[19] Further, distention causes pylorospasm and contractions of the pyloric antrum if nausea or vomiting occurs.[20] The gastric flatulence of biliary tract disease is probably not due to fermentation or to the passage of gas from the blood into the stomach, although this idea has not been disproved, particularly in those patients who have anacidity. However, it has been found that appropriate distention of the gallbladder—a distention that causes loss of gastric tone but no evident nausea—may cause "aspiration" of air into the stomach owing to an apparent relaxation of the stomach and abdominal muscles.[20] (This phenomenon is not easy to demonstrate. One of us has seen this occur a number of times in lightly anesthetized dogs with the abdomen open while the stomach was visibly relaxing and becoming atonic.) Changes in heart rate, extrasystoles and arrhythmia may be induced by distention of the biliary tract in the dog, which may explain the improvement in cardiac rhythm reported to occur after cholecystectomy in some patients.[21] An analysis of the theories of referred pain indicates that pseudo-angina or cardiac pain with distress in the biliary tract or vice versa means that disease is present in both the coronaries and the biliary tract. The effect of distention of the biliary tract on the small and large intestine, according to our knowledge, has not been studied.

SPHINCTER OF ODDI

In recent years considerable knowledge regarding the sphincter of Oddi in man has been contributed.[8] Its only clearly demonstrated function is that it is necessary for the filling of the gallbladder. Schwegler and Boyden's [22] embryologic and anatomic study has clearly established its independent development and has shown that a definite group of circular fibers, called the sphincter choledochus, invests the ampulla and common duct distal and proximal to their junction. Using intact subjects or patients with an intubated cystic or common duct, important contributions to the physiology and pharmacology of the sphincter or the resistance to the flow of bile into the duodenum have been made. Biliary colic has been produced in the intact biliary tract by causing the gallbladder to contract in the presence of a spastic sphincter. Magnesium sulfate instilled into the duodenum relaxed the sphincter and relieved the colic.[23] With the common duct intubated, the following observations have been made: (*a*) After recovery from the operation, the average sphincteric resistance is 15 cm. of water (from 9 to 25 cm.) pressure. (*b*) In patients with inflammatory lesions, such as cholangitis secondary to stone, it is not uncommon for the sphincter to remain irritable for several weeks [24] and the resistance to fluctuate from 30 to 50 cm. or higher. (*c*) A carbohydrate meal has no significant effect on the sphincter, but a fatty meal decreases resistance.[25] (*d*) Morphine, pantopon (hydrochlorides of the alkaloids of opium, principally morphine), dilaudid and codeine increase resistance and amyl nitrite, glyceryl trinitrate, theophylline and magnesium

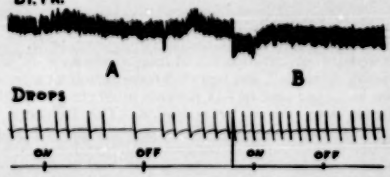

Fig. 1.—Effect of distention of the colon (*A*) before and (*B*) after section of the hepatic nerves on bile formation.

sulfate decrease resistance.[7] (*e*) In the presence of a spastic sphincter, distention of the duct (from 15 to 20 cm. of water) causes the biliary colic type of pain.[26] Thus, the basis of the concept of biliary dyskinesia has been clearly and adequately demonstrated experimentally in man.

What causes a sphincter to become hypertonic, spastic or irritable is another question. Inflammation of the ampulla could do so by rendering the muscle hyperirritable; but, strictly speaking, this would not be a functional disturbance. Hypertrophy of the sphincteric muscle has been demonstrated,[27] but the cause of the hypertrophy is unknown. Reflex causes have been postulated but not proved. Inflammation or an irritable duodenum might involve the sphincter directly or indirectly.

Can the sphincter of Oddi be caused to contract reflexly? This is obviously an important question. The question has particularly intrigued us because com-

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27. Giordano, A. S., and Mann, F. S.: The Sphincter of the Choledochus, Arch. Path. **4**: 943 (Dec.) 1927.

plaints of constipation and biliary tract disorders are so frequently associated and because constipation and biliary tract disease are prone to develop in pregnancy.

For example, with regard to pregnancy, it is reported clinically that from 70 to 90 per cent of women who have gallbladder disease necessitating operation are mothers.[28] Delayed evacuation in the latter part of pregnancy has been observed in man and animals.[29] Potter and others [11] have found that the bile in the

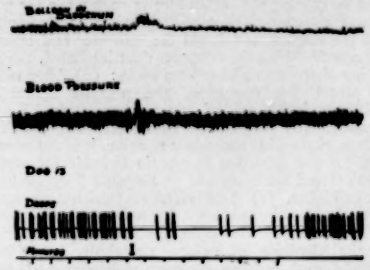


Fig. 2.—Effect of stimulation of the inferior mesenteric plexus at 1 on the resistance to the flow of bile through the sphincter of Oddi into the duodenum. Note that stimulation of the plexus caused a temporary contraction of the duodenum and a more prolonged increase in the resistance to the flow into the duodenum.

gallbladder late in pregnancy is chemically altered. This is brought out in the accompanying table. The occurrence of constipation during pregnancy is well known. Blalock [30] has reported constipation as a symptom in 62 per cent of 735 patients in whom gallbladder disease was proved by operation. The incidence of cholecystopathy is doubled in persons with diverticulosis of the colon [31] and in patients with peptic ulcer and recurring appendicitis.[32] Many other clinical reports indicate the possible existence of a causal relationship between abnormal functioning in the alimentary tract, particularly the colon, and cholecystopathy. This possibility is emphasized by the observation of Boyden and Birch [33] that faradic stimulation of the peritoneal surface of the duodenum, jejunum and cecum in animals caused an enlargement or relaxation of the gallbladder.

The retarded evacuation of the gallbladder during pregnancy might be due to (*a*) very thick bile due to reflex inhibition of bile secretion, (*b*) reflex hypertonus of the sphincter and duodenum, (*c*) reflex inhibition of the gallbladder, (*d*) the action of sex hormones on the gallbladder or (*e*) a metabolic change in the chemistry of the bile. Constipation might predispose to cholecystopathy by the same mechanisms except that of the sex hormones. We have to date tested only two of these possibilities, namely, *a* and *b*.

EXPERIMENTAL

The Effect of Distention or Stimulation of the Colon on Bile Secretion.—Dogs were anesthetized and the bile duct was cannulated for the collection of bile; the cystic duct was tied. The flow of bile was recorded electrically. The colon was distended with water or its nerves were stimulated electrically.

In twelve of fourteen dogs, distention of the colon with water reduced the secretion of bile by 50 per cent (fig. 1). Stimulation of the central end of the colonic, inferior mesenteric or superior mesenteric nerves of sixteen dogs caused a similar inhibition of bile secretion. Section of the hepatic nerves prevented the inhibition of secretion. This proves that the decrease in secretion was reflex in nature. When the bile flow was brisk after an injection of bile salts, the secretion was more difficult or impossible to inhibit. Distention of the proximal colon appears to be more effective than distention of the distal colon in eliciting the inhibition.

The Effect of Stimulation of the Colonic Nerves on the Sphincter of Oddi and the Duodenum.—The method of recording changes in the resistance of the sphincter and in the tone of the duodenum used previously in our laboratory was employed.[34] In brief, it consists in raising the pressure in the bile duct until a flow into the duodenum is established; then the colon is stimulated and the flow ceases. Then the pressure in the bile duct is raised until the flow appears. Simultaneous records of duodenal motility are made with a balloon.

In 90 per cent of the experiments, which were repeated several times in thirteen animals, stimulation of the nerves of the colon or inferior mesenteric plexus caused an increase in resistance of the choledochoduodenal mechanism (fig. 2). In 75 per cent the duodenal motility was increased and was associated with an increase in the resistance to the flow of saline solution into the duodenum. In most of the tests the increase in resistance outlasted the duration of the stimulation and in half of the tests the increase in resistance outlasted the increase in duodenal tone. The increase in resistance varied from 5 to 21 cm. of saline solution pressure (fig. 3).

Fig. 3—Effect of stimulation of the colonic nerve on the resistance to the flow of bile into the duodenum. At 3, the nerve was stimulated. At 4, fifteen minutes later, the pressure in the common duct had to be elevated 12 cm. of pressure to obtain a return of flow. At 5, the nerve was stimulated again and the pressure had to be elevated 9 cm. more to reestablish a flow. At 6, the nerve was stimulated again. Thus, two stimulations of the colonic nerve increased the resistance from an original of 23 cm. to 54 cm., an increase of 21 cm.

COMMENT

The results of these experiments provide two mechanisms by which constipation may promote gallbladder or biliary tract stasis. Although they tend to confirm clinical impressions and observations, they cannot be directly applied to man. They are sufficiently decisive and important to indicate prophylactic therapy and to stimulate research to ascertain whether such mechanisms actually operate in man. There is no a priori reason to doubt their existence in man.

28. Huggins, R. R.; Harden, Boyd, and Grier, G. W.: A Study of the Relationship of Pregnancy to Disease of the Gallbladder, Surg., Gynec. & Obst. **61**: 471 (Oct.) 1935.

29. Mann, F. C., and Higgins, G. M.: Effect of Pregnancy on Emptying of Gallbladder, Arch. Surg. **15**: 552 (Oct.) 1927. Gerdes and Boyden.[26]

30. Blalock, A. A.: Clinical Study of Biliary Tract Disease, J. A. M. A. **82**: 2057 (Dec. 27) 1924.

31. Kocour, E. J.: Diverticulosis of Colon, Am. J. Surg. **37**: 433 (Sept.) 1937.

32. Good, C. A., and Kirklin, B. R.: Influence of Extrabiliary Disease on Functions of the Gallbladder, Am. J. Roentgenol. **37**: 346 (March) 1937.

33. Boyden, E. A., and Birch, C. L.: The Reaction of the Gallbladder to Stimulation of the Gastrointestinal Tract, Am. J. Physiol. **92**: 287 (March) 1930.

34. Sandblom, Philip; Voegtlin, W. L., and Ivy, A. C.: The Effect of Cholecystokinin on the Choledochoduodenal Mechanism (Sphincter of Oddi), Am. J. Physiol. **125**: 175 (Sept.) 1935.

SUMMARY

Experimental results show that constipation or irritation of the colon or stimulation of the various divisions of the splanchnic nerves may predispose to stasis of the biliary tract by decreasing bile formation and by increasing the resistance to the flow of bile through the sphincter of Oddi into the duodenum.

303 East Chicago Avenue—University of California Hospital.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

MERIT SHORT WAVE DIATHERMY NOT ACCEPTABLE

Manufacturer: Merit Health Appliance Company, 1301-1303 South Lorena Street, Los Angeles.

An apparatus brought to the attention of the Council recently in behalf of public welfare is the Merit Short Wave Diathermy Unit. The Council concludes from an advertising folder called "Now! Short Wave Diathermy in Your Home . . . Relief Without Drugs" and from a letter addressed to a dealer that the unit is sold directly to the public for self treatment of disease. To quote, "ADVANTAGES OF HOME TREATMENT. . . . There when you need it—The old axiom 'an ounce of prevention,' etc., holds true today. Therein lies one of the chief advantages of having MERIT SHORT WAVE DIATHERMY in your home right when you need it. When the ailment is in its initial stages it is there ready to use and its application may prevent further progress of the disease. MERIT SHORT WAVE DIATHERMY can be used by every member of the family."

According to the advertisement, the device is portable and includes two pad electrodes as accessories, with sinus applicators available. According to the letter to a dealer, the apparatus utilizes two vacuum tubes of the T40 type. The manufacturer states that the maximum output for the unit is rated at 100 watts, and that the input for an average treatment is 225 watts. It operates on 110 volt 50 or 60 cycle alternating current.

Among the objectionable features that have been noted in the advertising is that the device is advocated for the effective treatment of many diseases for which the use of diathermy has not been substantiated, the treatment apparently to be self prescribed and administered by laymen. Among the ailments suggested for treatment are common colds, bronchial asthma and bronchitis, aching feet, sinus infection, "ailments common to women," high blood pressure, "agonizing pain" and "many stubborn diseases." It is stated that the unit is easy to use and that it "is so simple that even a child can operate it." Other objectionable statements in the advertising and letter include ". . . the old methods of application (of heat) are ineffective, uncertain and uncomfortable," "Short Wave Diathermy . . . countless thousands of sufferers have found it to be one of the safest, pleasantest, and most effective methods of treatment ever discovered." "It is similar to and as effective as the larger sets used by physicians, but is especially designed and simplified for home use." The firm suggests that diathermy be used for the destruction of bacteria, but no evidence is available that such an apparatus as this will cause bacterial destruction in the human body.

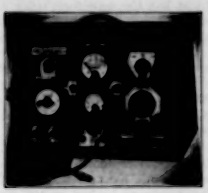
In the opinion of the Council, the Merit Health Appliance Company appears to be promoting an instrument in a way that is detrimental to public interest and to rational therapeutics. Sales methods which promote self treatment of disease by those unqualified to practice medicine and appeal to the public with unscientific persuasions may harmfully enhance a feeling of false security on the part of the public.

In view of the foregoing report, the Council on Physical Therapy voted not to accept the Merit Short Wave Diathermy Unit for inclusion in the Council's list of accepted devices.

BURDICK IONOPHORE ACCEPTABLE

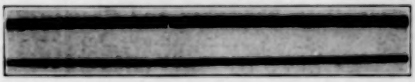
Manufacturer: The Burdick Corporation, Milton, Wis.

The Burdick Ionophore generates galvanic current designed for use in iontophoresis, muscle stimulation and medical electrolysis (removal of hair). It is a portable unit with a front cover which is removable in order to expose the dials. Standard accessories include negative and positive patient cords, line cord, 2 foot cords with bulldog clips, one 6 by 8 inch Morse surface electrode and electrode material for iontophoresis. It weighs 26½ pounds and its dimensions are 10 by 11 by 14½ inches.

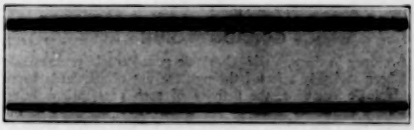


Burdick Ionophore.

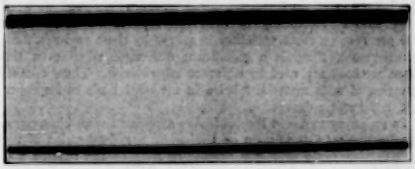
The unit is equipped with two valve rectification and an extra capacity filter. The firm claims that it generates ample, smooth electric current, which, in order to prevent pain and electric shocks, is automatically built up slowly at the turning on of the power and gradually decreased to zero at the termination of the treatment. One voltage control is adjustable for "low, medium and high" and a milliamperage control is adjustable to the given ranges of voltage up to 60 milliamperes. A pilot light indicates when the desired intensity of current is reached and glows throughout the treatment; an automatic timer shuts off the current at the designated time. The resistance of the patient's circuit, an index of the efficiency of the electric contacts, is measured by a resistance meter operating through an independent circuit. The polarity of the electrodes may be reversed by a control on the panel, eliminating the need of reversing the leads during a treatment. Models are available for operating on 110 volt 60 cycle alternating current or 110 volt direct current.



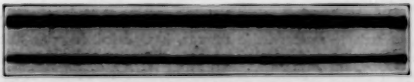
1. Oscillogram. Load 1,500 ohm resistance. Current 20 milliamperes.



2. Oscillogram. Load 1,500 ohm resistance. Current 40 milliamperes.



3. Oscillogram. Load 1,500 ohm resistance. Current 60 milliamperes.



4. Oscillogram. Load 3,000 ohm resistance. Current 20 milliamperes.

The Council investigated the electrical characteristics of the Ionophore by a string oscilloscope and obtained tracings of the current output on photographic films. The oscillograms were made with a stationary film since the output was continuous. The second element of the oscillograph was held at the center of the film to provide a guide line for comparison.

These oscillograms were made under the following conditions: Numbers 1, 2 and 3 were made with a load resistance of 1,500 ohms but the output currents were 20, 40 and 60 milliamperes respectively. Number 4 was made with a 3,000 ohm load and an output current of 20 milliamperes.

This direct current was filtered through a condenser to eliminate the direct current component and no ripple was apparent.

The resistance meter found on this machine is a standard type much used in making resistance measurements. As such, it performs within acceptable limits of accuracy. It has no effect on the other functions of the machine. In establishing the external circuit for this unit, many variables would be encountered, such as moisture in the skin and in the electrodes, area of the path, the current traveled and the chemical substances at the points of contact of the electrodes. With this meter such variables can be integrated into a single value in ohms.

The unit was submitted to a qualified physician for clinical trial and investigation, and he reported that it gave satisfactory service.

In view of the foregoing report the Council on Physical Therapy voted to accept the Burdick Ionophore for inclusion in the Council's list of accepted devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. PAUL NICHOLAS LEECH, Secretary.

ASSAY STANDARDS FOR CHORIONIC GONADOTROPIN

Accuracy in therapy with chorionic gonadotropin preparations has been seriously affected through the use of standards based on biologic reactions, the activity of such preparations being generally stated in terms of rat units. The rat units of the various firms marketing chorionic gonadotropin differ, however, to a varying extent. Some firms employ an assay method based on a minimal ovarian response in the immature rat, others use the induction of an estrous vaginal smear as the end point of their assay. According to impartial sources[1] there may be 100 per cent or more variation in assays by these two methods. Furthermore, there is a significant difference when even the same methods are used by different laboratories. Thus, administration of such material labeled in rat units leads to improper and unscientific dosage.

In an effort to avoid the confusion associated with bio-assays, the Permanent Commission on Biological Standardization of the Health Organization of the League of Nations has devised and adopted an international standard of chorionic gonadotropin. This international standard is described in the memorandum of the League of Nations Health Organization which is appended to this report.

As the adoption of such a standard in this country would contribute to more reliable therapy, it appeared desirable that the Council consider for adoption a similar standard. In preparation for the Council's possible action the Advisory Committee on the Nomenclature of Endocrine Principles was consulted by questionnaire. The replies from the members of this committee were practically unanimous in recognizing the need for a suitable standard and in approving the international standard as adopted by the League of Nations Commission.

1. D'Amour, F. E., and D'Amour, M. C.: Potency of Certain Commercial Hormone Preparations, Endocrinology **23**:383 (May) 1938. Guenshauer, Ferdinand, and Bradbury, J. T.: Comparative Potency of Commercial Anterior Pituitary-like Preparations, ibid. **24**:867 (June) 1939.

The Council therefore voted that the international standard for chorionic gonadotropin as devised by the League of Nations Health Organization be adopted by the Council and that firms whose preparations of this substance are considered for acceptance be required to assay the activity of their material according to this standard and label such activity in international units.

The international standard for the gonadotropic substance of human urine of pregnancy, chorionic gonadotropin, is appended.

LEAGUE OF NATIONS HEALTH ORGANISATION MEMORANDUM

INTRODUCTION

During 1937 and 1938 an inquiry was made among interested workers as to the practicability and desirability of establishing an International Standard for the gonadotropic substance of human urine of pregnancy. It was recalled that preparations of this substance were standardized in a great variety of ways and that there was no method of equating the various types of units, defined in terms of animal reactions, used by different workers and manufacturing organizations. The survey showed that there was complete unanimity as to the desirability of establishing a standard, and the offers of material received from various quarters made it evident that there would be no practical difficulty in constituting a standard preparation in adequate quantity to serve world requirements.

At the third International Conference on the Standardization of Hormones, held in Geneva in August 1938 under the auspices of the Permanent Commission on Biological Standardization of the Health Organization of the League of Nations, the results of the preliminary survey were considered and it was unanimously decided to arrange for the establishment of an International Standard for the gonadotropic substance of human urine of pregnancy.

The conference had before it the results of a cooperative examination of the various contributions offered toward the proposed standard, and they were able to formulate details of the manner in which the contributions should be mixed. They also defined a unit of activity in terms of the proposed mixture, subject to confirmation after specimens of the mixture had been assayed by members of the conference.

The contributions were subsequently mixed as arranged and a specimen approved by each member of the conference. The standard was established, and the unit brought into current use on April 1, 1939.

PREPARATION AND FORM OF ISSUE OF THE INTERNATIONAL STANDARD

Contributions from six sources were used in preparing the standard, substantial amounts of material approved by the conference having been generously provided by each of the following:

Boots Pure Drug Co., Ltd., Nottingham, England.
I. G. Farbenindustrie Aktiengesellschaft, Elberfeld, Germany.
Løvens Kemiske Fabrik, Copenhagen, Denmark.
N. V. Organon, Oss, Netherlands.
Parke, Davis & Company, Detroit.
E. R. Squibb & Sons, New Brunswick, N. J.

Several of these preparations were already largely diluted with lactose and, as a first step in the mixing of the contributions, those preparations not already so treated were diluted to an activity equal to that of the most active diluted preparation by the addition of an appropriate amount of lactose.[2] At this stage a bulk of material amounting to about 800 Gm. was obtained. The material was then dried by exposure to P_2O_5 in vacuo and made into tablets of approximately 10 mg. without the addition of further excipient. A test weighing of tablets showed that 86 per cent were within ± 5 per cent of the 10 mg. aimed at.

The tablets were then packed in lots of twenty-five in small amber tubes, which were plugged with cotton wool and placed in ampules. The ampules were evacuated, filled with pure, dry nitrogen and sealed. A cork to fit the inside amber tube was

2. The whole of the contributions were then carefully mixed and further diluted with an equal amount of lactose.

also enclosed in each ampule. This method of double packing was devised to ensure the exclusion of oxygen from the finally sealed ampule, as laid down in the Report of the Conference, and at the same time to provide a suitable container for the tablets after the ampule had been opened and discarded. The finished ampules were transferred to the cold-room and are maintained constantly at a temperature of —2 C.; 2,854 of these ampules, each containing twenty-five 10 mg. tablets, were prepared. The standard is kept by the Department of Biological Standards, National Institute for Medical Research, London, N.W. 3.

The whole of the mixing, compressing and packing of the standard was generously carried out by Burroughs Wellcome & Company as a contribution toward the work.

DEFINITION OF THE UNIT

The definition of the unit adopted by the third International Conference is as follows:

> The specific gonadotropic activity of 0.1 mg. (= 100 gamma) of the standard preparation shall be the international unit for recording the activities of all gonadotropic preparations of human urine of pregnancy, *but only of such.*

The unit so defined is an amount of activity very similar to that required, under the conditions used by many workers, to cause cornification of the vaginal epithelium of the immature rat.

SUGGESTIONS FOR USE

After the ampule has been opened, the inner tube should be removed, freed from cotton wool and closed with the cork provided. One or more tablets, each of which contains about 100 units, should be removed as required. The tablets are as constant in size as is practically possible, but it is essential that they should be weighed before use, so that a solution can be made of an exactly known strength, on the basis of 10 units for each milligram of ascertained weight. The tablets dissolve very readily in water or saline solution.

After the ampule has been opened, the amber tube containing the tablets of the standard preparations should be kept in a small desiccator containing P_2O_5.

USE OF STANDARD IN BIOLOGIC ASSAY

The following recommendations for use of the standard are taken from the Report of the Conference, Bulletin of the Health Organisation of the League of Nations 7:889, 1938.

> "The only tests for the comparative determination of gonadotropic activity, in units as above defined, on which the Conference has evidence to justify recommendation, depend on:
>
> (a) The observation of a direct or indirect gonadotropic effect, shown by morphological changes in the gonads;
>
> (b) The observation of secondary changes in the accessory reproductive organs, in animals not deprived of their gonads. When this type of test is used, the absence of substances directly causing such changes in the accessory reproductive organs should be assured by control tests on animals deprived of their gonads."

GLYCOLIXIR NOT ACCEPTABLE FOR N. N. R.

The number of inquiries which are received by the Council on Pharmacy and Chemistry concerning Glycolixir (E. R. Squibb & Sons) indicates the desirability of the publication of a report on the status of this preparation.

Glycolixir (Elixir Glycocoll Squibb) is the trade name for a preparation manufactured by E. R. Squibb & Sons, New York, which is stated to be a "tonic elixir" developed for use in patients "lacking considerably in energy," for whom a drastic regimen is unnecessary or unsuited. It is said to contain 28 grains of aminoacetic acid (glycocoll) per tablespoonful (½ fluidounce), indicated on the label as the average adult dosage. This represents approximately 1.8 Gm. of aminoacetic acid (glycocoll) in 15 cc. of the mixture. The vehicle is stated to consist of a "specially blended base of fine wine." The label also declares the presence of ethyl alcohol (12 per cent by volume).

The rationale of using such a preparation as a "tonic" on the basis of its aminoacetic acid content may be questioned. Several brands of aminoacetic acid N. N. R. stand accepted on the basis of the reported effectiveness of these preparations in myasthenia gravis, progressive muscular dystrophy and pseudohypertrophic muscular dystrophy. There is no satisfactory evidence to warrant recommendations for use of the substance in combating fatigue such as might be encountered in patients for whom a "tonic" may be considered desirable. There is likewise no suitable evidence in support of the claims for the value of aminoacetic acid in stimulating appetite.

In a recent report (THE JOURNAL, July 8, 1939, p. 127) the Council on Foods has discussed available evidence in support of the claim that increased muscular endurance and delay in fatigue follow the ingestion by healthy men of gelatin, a protein which contains about 25 per cent of aminoacetic acid. In the opinion of the Council on Foods the available evidence does not justify the claims made.

In Squibb and Sons' advertising pamphlet "Glycolixir," on page five, there appears a quotation taken from the *Proceedings of Staff Meetings of the Mayo Clinic*, attributed to Dr. Russell M. Wilder:[1]

> "I am satisfied that I have been capable of more sustained effort since taking glycine, and other healthy subjects will tell the same story."

In a recent communication to the headquarters of the American Medical Association, Dr. Wilder has stated that the quotation was made without his permission. He further stated that the omission of the clause with which the original sentence ended completely changed its significance. The clause ending the sentence is quoted from his letter as follows: "but testimonial evidence such as this will not satisfy the critical mind." Dr. Wilder also indicated that the experiment on himself demonstrating a reduction of the output of creatine during exercise following the use of glycine was inadequate evidence of the effectiveness of this drug in muscle fatigue. He stated that it represented "an illustration of the kind of evidence which would need to be accumulated before conclusions could be drawn."

Despite the lack of suitable basis for its claims, the firm suggests the use of the product for the treatment of children who are underweight. Two dosage forms are available: The "Elixir," already described, and "Tablets," containing 1.0 Gm. of aminoacetic acid. The tablet form is claimed to be useful whenever the alcohol in the elixir is undesirable. The average dosage for both children and adults is stated on the bottle label of the "elixir." While this in itself is not objectionable, it is obvious that it suggests the usefulness of the elixir in children for the purpose of combating loss of weight, appetite or endurance. In the opinion of the Council this claim is unwarranted not only on the basis of insufficient clinical evidence but also because it may encourage the use of alcohol medication in children, or in adults suffering from muscular dystrophy. In either case the use of alcohol is contrary to the best modern therapeutic practice. If only the tablet form of Glycolixir was intended for such uses, no reference to dosage for children should appear on the label of the "elixir." It would seem, however, that the recommended adult dosage of two tablets three times daily could not be expected to be effective for such use as is recognized by the Council for aminoacetic acid, N. N. R., wherein from 20 to 30 Gm. is the recommended daily dosage. For this dosage the tablet form of Glycolixir would necessitate administration of from twenty to thirty tablets daily. It is apparent, therefore, that Glycolixir in both forms is intended for use as a "tonic," for which purpose the Council objected on the grounds of unwarranted therapeutic claims.

The Council declared "Glycolixir" unacceptable for inclusion in New and Nonofficial Remedies because (*a*) there is inadequate evidence to establish the claims made for the efficacy of its active ingredient, aminoacetic acid (glycocoll, glycine), in conditions other than various muscular dystrophies, (*b*) its alcoholic content is undesirable as a component of medication intended for children, (*c*) it is promoted in part by misquotation of references in advertising which is misleading, and (*d*) it is marketed under a proprietary name with unwarranted therapeutic claims in a manner which is inimical to the best interests of the public and the medical profession.

1. Wilder, R. M.: General Discussion, Proc. Staff Meet., Mayo Clin. 9:606 (Oct. 3) 1934.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 30, 1939

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

THE PRESIDENT GIVES INTERVIEW ON HEALTH PLANS

On December 22 President Franklin D. Roosevelt, in his regular interview with the press, gave definite intimation as to his point of view relative to proposed legislation in the field of health. According to a report from the United Press, he said that the administration is considering a program for federal construction of hospitals in areas where such facilities are lacking, and he intimated that the plan might be recommended to the coming Congress. According to the United Press, he said the program, if undertaken, would start modestly but could be enlarged as desired. No estimate of the cost has been completed, but the President emphasized, says the report, that it would cost less than the more extensive health and school programs proposed in bills introduced by Senators Robert F. Wagner, of New York, and Pat Harrison, of Mississippi.

According to the United Press, his comments indicated that he is dissatisfied with both these measures. He said that the Wagner or Harrison bills would cost a lot of money and that the chief trouble was in the requirements for states to match federal funds. The new program he outlined would provide that the government bear 100 per cent of the hospital construction costs, retain title to the institutions and build them only in areas where local interests offered satisfactory assurances that they would operate and maintain the institutions.

Under a matched program, Mr. Roosevelt is said to have pointed out, those states which have the most money could obtain the most federal funds. "They already have the best hospitals and health conditions, he pointed out," says the United Press report, "while the poorer states have a lower health level and insufficient funds to obtain federal money on a matched basis. Since elimination of the PWA 55-45 matched money program, the President said, the federal government could afford to finance in a small way medical centers in those areas needing them. He suggested fifty hospitals as a start. He pointed out as an example one New York county of 100,000 population with six good hospitals and three Southern counties of the same population without any medical facilities. The cost of the program he has envisioned would not be great, but it would mark the first experimental steps to bring health facilities to those areas needing them most, he explained. The major part of the work would be done by the WPA as far as possible, he said. The Public Health Service and a committee of doctors would pass on the plans and determine the ability and willingness of localities to operate and maintain the institutions. The President said he had talked over the plan with a number of doctors and will discuss it soon with the American Medical Association.

"He said doctors from many locales had told him they were unable to raise capital to build hospitals but that if they could get small plants they could maintain and operate them. As outlined by the President, each institution would consist of a one story hospital building of two wings, one each for white and colored persons, and an administration building with clinic, operating room and laboratory. He estimated that each hospital would provide 100 beds at a cost of around $150,000. The President emphasized that his program is no grandiose scheme for putting up hospital centers costing $10,000,000 each and said he did not think the medical association's objections to government health programs would apply to such small hospitals. The President said that Miss Josephine Roche, former Assistant Secretary of the Treasury, was remaining with his Interdepartmental Committee on Health, but he said it did not mean that Security Administrator Paul V. McNutt was being eased out of the health program. He said a story to that effect about McNutt was crazy and made out of whole cloth."

Thus the President has recognized some of the objectives of the platform of the American Medical Associa-

tion. He has recognized the primary objection inherent in the principle of grants-in-aid. The American Medical Association has approved the development of medical facilities where need can be shown, with provision for local administration and control. It has opposed the grandiose plans of the Wagner bill. The Board of Trustees and the officers of the American Medical Association have repeatedly offered their facilities and help and advice to the government in working out any sound plan for meeting immediately any needs which may be demonstrated.

EXPERIMENTING WITH STATE MEDICAL SOCIETY PLANS

While captious critics have been denouncing the American Medical Association as reactionary and obstructive, its members have been conducting numerous and extensive experiments during the last seven years in search of ways of organizing payments for medical service and adjusting the burden of medical costs to the abilities of varying economic classes. Never have so many, so varied or so significant projects been carried out in any other country. When the burden of medical care for the indigent disrupted the systems of county and township doctors, drained the resources of philanthropic organizations and became too heavy for gratuitous service by physicians to bear, the various state and county medical societies developed almost the only successful plans for efficiently distributing such resources as were available to provide medical care for the indigent.

During the period 1932 to 1938, between 200 and 300 county societies entered into contracts with relief authorities to provide medical service for the indigent. These were organized to include such protection to the interests of the patients and the public as free choice of physician and economical administration of the always insufficient funds. A number of county societies have also experimented with medical service bureaus for the low income classes. Some of these bureaus are still in operation and have been helpful to many persons in this class in enabling them to meet the costs of needed medical care. All these plans and all those which are now in operation are considered frankly as experiments to be expanded, restricted, altered or abolished as they prove their value in protecting the health of those served. If they are not found desirable they may be abandoned. The medical society stands the loss in time and money expended, but no political, financial or occupational vested interests are created and left behind to hamper further experiments.

Out of the extensive experience with county medical society plans sufficient knowledge has been gained to enable a number of state medical societies to undertake medical service plans on a statewide scale. At present at least fifteen states have such plans in various stages of development. These states include Arizona, California, Connecticut, the District of Columbia, Massachusetts, Idaho, Michigan, Missouri, New Jersey, New York, Oregon, Pennsylvania, Utah, Vermont and Washington. In some states such arrangements have progressed little beyond endorsement by the house of delegates of the state medical society and the appointment of a committee to prepare a plan. In California, New York, the District of Columbia and Michigan such plans are already offering their service to the public or will do so within the immediate future. In Connecticut, Michigan, New York, Pennsylvania and Vermont, special enabling legislation has been obtained to insure the legality of such plans. In most of the other states, opinions have been obtained from insurance commissioners or other state authorities that the proposed plans are permissible under existing legislation.

There is a wide variation among these plans such as naturally accompanies the experimental stage in the establishment of any social institution. New York and Utah provide for payment of benefits in the form of cash indemnity rather than directly in service. Most of the others provide medical care under close supervision. There is some diversity in the income classes included, although most of them set the upper limit at around $2,000 or $2,500 for families, with a lower income limit for individuals. Missouri classifies premiums according to three classes of incomes and according to certain variations as to the number of dependents within each income class.

The information gained from these experiments and obtainable from statistical studies of morbidity and medical care is still insufficient to afford dependable actuarial figures covering the cost of medical care given on such prepayment plans. One reason for this uncertainty is the failure of most previous prepayment plans and especially systems of compulsory sickness insurance to place safeguards around the quality of the service such as to insure that medical standards shall be maintained as high as possible. Neither has any way yet been found to estimate the increased demand for medical care that always accompanies any plan of prepaid medical service.

In the proposed plans, prepayments vary from $1.50 to $2.50 a month for individuals, with a lower rate for additional dependents in the same family. Much of this variation is due to provisions which limit the service to what it is believed can be furnished at the rates charged. There are also provisions for deducting the cost of a certain proportion of the first services given in any one year from the coverage of the plan. These restrictions and the methods of acquiring members represent an effort on the part of medical societies to approach a more nearly actuarial basis for operation and to deal honestly with those who are to receive the service. California provides that the subscribers shall pay for the first two calls in any one illness, the District of Columbia for the first $6, Michigan for the first $5 and New York for the first $10 expense in any one

given year. Some states also place a limit to the value of the service that is given in any single year. This is usually placed sufficiently high to cover all but the most exceptional illnesses and to make a substantial contribution where the total is not covered.

All these plans vest control in the medical profession, although several provide for lay members in their governing bodies. In all cases, arrangements are made to provide that medical standards shall be under professional control. The state medical societies have themselves provided, through appropriations from their treasuries and the gratuitous services of the organizing bodies, for the preliminary expenses of organization.

Current Comment

NEW VITAL STATISTICS HANDBOOK

The Bureau of the Census has completed a "Physicians' Handbook on Birth and Death Registration," developed to take the place of the older pocket edition. Copies of this book are being prepared for distribution in large numbers and will be shortly available on request from the Census Bureau and the state health offices. They can also be obtained by secretaries of county medical societies for distribution to their membership. As pointed out in the introduction, the information contained on birth and death certificates serves three cardinal functions: to provide citizens and official agencies with authentic records of births and deaths, to supply public health agencies and the medical profession with essential facts concerning births and deaths, and to furnish, for general social uses, statistical data such as life tables, population estimates and information on residence, migration and fertility. The book gives directions for filling and filing certificates of deaths and births. There is a brief description of the present registration system and the development of registration in the United States. The appendix contains the International List of Causes of Death with its index, a glossary of terms commonly used in vital statistics, a selected bibliography and selected tables and charts of vital statistics. Nearly all the information in this handbook will be needed at some time or another by virtually every practicing physician; distribution of the handbook is made easy and every physician would profit by availing himself of the opportunity to acquire a copy and becoming familiar with its contents.

PUBLIC INTEREST IN VENEREAL DISEASE

The number of clinics treating patients for syphilis during the last fiscal year was 2,405, an increase of 287 per cent over the number for the fiscal year 1930. The number of doses of the arsenical drugs used for the treatment of syphilis amounted in the last fiscal year to 10,656,253, an increase of 84 per cent over the number of doses of such drugs used in 1933. More than five and a half million blood tests for syphilis were made in the United States during the last fiscal year, whereas in 1930 only 1,632,083 blood tests were reported. The larger figures are no doubt the result of greater public interest in venereal disease control, which has been stimulated by the development of more adequate facilities in the various states made possible by the Venereal Disease Control Act of 1938. Vonderlehr, in addressing a mass meeting in Pittsburgh, pointed out that continued progress in venereal disease control depends on constant improvement of standards in case finding, diagnosis and treatment. He recommended that every community in the United States which has a venereal disease control program check its program against nine elements considered by the U. S. Public Health Service essential to adequate control of syphilis. The nine points are: 1. A trained public health staff which knows how to deal with syphilis. 2. Regulations requiring reporting and follow-up on all cases of syphilis. 3. Facilities for treatment of all patients—both those who can and who cannot pay. 4. Free laboratory service available to all physicians and clinics. 5. Distribution of free antisyphilitic drugs to all physicians and clinics. 6. Blood tests for all pregnant women, and treatment where required. 7. Blood tests of all persons before marriage. 8. Blood tests in all complete physical examinations. 9. An educational program. Syphilis appears to be retreating, it was said, in those communities where the control program includes these fundamental points.

NEW LIGHT ON LEISHMANIASIS

Undaunted by war, the spirit of research is alive in China. Working independently, two groups of workers in Peiping have found that open cutaneous lesions in dogs contain Donovan bodies and evidently are an important factor in the spread of canine leishmaniasis. Feng, Chung and Hoeppli (a Swiss parisitologist) [1] from the Peiping Union Medical College and Ho [2] from the department of public health in Peiping share in the finding of these conditions in the Far East. Feng and Chung [3] report that infection by sandflies from dog to dog was relatively easy and depended directly on the number of flagellates in the cutaneous lesions of the dog. The transmitting sandfly (Phlebotomus sinensis) is quite common in North China. It is still an open question whether the canine and human flagellates are identical, but much evidence points in this direction: dogs have been successfully infected with material from human leishmaniasis,[4] canine cutaneous leishmaniasis and human visceral kala azar have been found in the same household,[4] and the flagellates found in man, in the dog and in the sandfly were indistinguishable from Leishmania donovani.[5] While cutaneous and visceral leishmaniasis in dogs in the Mediterranean basin has been described, canine leishmaniasis has been found rarely in India in endemic areas of human kala azar.[6] The results reported from Peiping shed more light on this insidious infectious disease and are of particular importance for its control by the Chinese hygienists.

1. Feng, L. C.; Chung, H. L., and Hoeppli, R.: Chinese M. J. 53:371 (April) 1939.
2. Ho, E. A.: Chinese M. J. 53:566 (June) 1939.
3. Feng, L. C., and Chung, H. L.: Chinese M. J. 53:35 (July) 1939.
4. Feng, Chung and Hoeppli,[1] Ho.[2]
5. Chung, H. L., and Feng, L. C.: Chinese M. J. 53:47 (July) 1939. Lee, C. U.: Chinese M. J. 51:951 (June) 1937.
6. Adler, Saul: Report, Third International Congress of Comparative Pathology, 1936. Feng, Chung and Hoeppli.[1]

ORGANIZATION SECTION

ANNUAL CONFERENCE OF SECRETARIES OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

Held in the American Medical Association Building, Chicago, Nov. 17-18, 1939

Address of Temporary Chairman

DR. ARTHUR W. BOOTH, Chairman of the Board of Trustees of the American Medical Association: I regard this conference of secretaries of extreme importance, perhaps next only in importance, to the House of Delegates. That body, of course, expresses the desires of the entire profession, but it is for you to disseminate that desire to the general practitioners throughout the states. It is customary to have a permanent chairman appointed from your body. I will entertain any nominations.

Dr. Creighton Barker, New Haven, Conn., was chosen and assumed the chair.

Address by Dr. Rock Sleyster

DR. ROCK SLEYSTER, Wauwatosa, Wis. (after a description of the various functions of the Association): This wonderful building houses the major activities of your Association. It has been repeatedly enlarged in an effort to provide space to care for ever increasing demands on the Association for service. Each time it was thought the new space acquired would care for needs for many years to come, only to have its capacity taxed to the limit almost immediately. Each year demands grow, and at the present rate of increase in demands for service of present and proposed activities it will not be many years before another addition to the building will be necessary. May I urge that during your stay you visit and become as familiar as time will permit with the various departments of your headquarters and that you urge your membership as well, when in Chicago, to come here and learn first hand of the activities they sponsor, for it is your building, it is their building.

But do not forget, 535 North Dearborn Street is not the American Medical Association. You are the American Medical Association. The 115,000 members you represent, scattered far and wide over this great country, are the American Medical Association. This is only a building, housing your employees, functioning to carry out your directions. These activities have been developed only at your command. No officer, no board, no bureau, council or committee may formulate policy or institute major activities you have not authorized. We who have served here are your servants. We have tried to carry out your directions to the best of our ability. We have worked to develop the progress in medicine you, through your House of Delegates, have instructed us to perfect. We have at all times fought in defense of the policies and ideals you have adopted.

We as a profession have been accused of many shortcomings, but I am confident that there would be no cause for fear if the people could have the opportunity you have today to become familiar with the activities of the Association. And I venture to say that some of the thoughtless criticism by members of our own profession would be stilled by a visit here. I wish it were possible to require each state and county association to send representatives here each year. I know of nothing that would be productive of more good. You secretaries and editors can, however, do much to encourage visits and to carry to your members some better knowledge of the work being done here at their direction—some better realization of the resources available to them and the services which are and can be rendered to them.

I, for one, am proud of this great organization. I am proud of this great headquarters established and maintained without cost to its members. I am proud of the service it renders to its members, to science, to the public. Is this the story of selfishness, of greed? Or is it the realization of a great and unselfish ideal? Is it maintained for material benefits or is it the fulfilment of years of effort and purpose better to serve humanity? Is this building a monument to personal interest or is it a temple dedicated to higher service, to the protection of the people against fraud and to the defense of the advancement of science and honesty in its application? Name one single activity here which does not bring a hundredfold more benefit to the people we serve than is brought to the individual member in material reward.

Members of the conference—if you will forgive the interjection of a personal motif in my conclusion—I want to say that I have participated in every conference of state secretaries and editors which has been held. I participated many years as a state secretary, as an editor, as a member of the Board of Trustees and this year as your President. It has been an occasion I have always looked forward to with keenest anticipation. To these conferences I am indebted for valuable information acquired and for inspiration to carry on in our great cause. If this were not reward enough for the effort and sacrifice to attend, I have been paid a thousand times by the friendships I have made. You are a truly outstanding group of men. In your hands, more than in any others, lies the destiny of American medicine, for your opportunity for service is greater than that given to most medical men.

It is with a feeling of sadness and regret that I realize this will be my last opportunity after all these years to participate in your proceedings in an official capacity. I want you to know, however, that as a private in the ranks I hope to be with you and "listen in" for old time's sake.

I, for one, cannot go along with those of a defeatist state of mind. I do not believe that the frontiers of medical service have been even reached. Granted that we maintain our ideals and objectives, that we remain true to our duty, that we remain steadfast in our defense of our age old standards of righteousness, I do not believe we shall be forced to defeat in our purpose to continue the advance in good medical care at a cost the people of this country can pay. We are 115,000 strong, a gain of 17,000 during the past five persecution years. We are a truly united profession. No selfish purpose has brought us together; we exist that we may better serve. Let us dedicate ourselves anew to the distribution of this type of service to even the poorest and the humblest home.

Medical Care in the United States

MR. C. ELLSWORTH NYBERG, Chicago: Any survey or statistical study should be preceded by a statement of the problem on which information is desired, an outline of the objectives to be attained, and the method to be used in the study. The Board of Trustees in their resolutions of December 1937 stated the purpose of the nationwide study of medical care. These resolutions were as follows: First, to determine for each county in the United States the prevailing need for medical and preventive medical service where such may be insufficient or unavailable; second, to develop for each county the preferable procedure for supplying these several needs. These resolutions were considered and approved by the House of Delegates of the American Medical Association at the annual session in June 1938. The Board of Trustees also established a Committee on the Supply of Medical Service, which cooperated with the Bureau of Medical Economics in the general conduct of this study.

METHOD OF COLLECTING DATA

The purpose of the study was to discover the number and nature of medical services and facilities in the counties studied, the agencies and methods that exist for the distribution of medical services, the degree to which the available services and facilities meet the medical needs of the various population groups in the surveyed counties and the extent to which desire

for medical services coincided with medical needs. State and county medical societies were asked to prepare reports, based on the factual data collected, containing recommendations of changes that were considered desirable in the methods of distributing medical care.

This term "medical care" as used in this study refers to the service and facilities available from physicians, dentists, nurses and pharmacists, hospitals and related institutions. Since the study was concerned primarily with the distribution of medical services, it was natural to seek information from those persons, agencies or organizations that in some manner arrange to provide medical service as well as from those persons who actually provide the services. Therefore, besides physicians, dentists, pharmacists, nurses and hospitals the sources of information included health departments, welfare and relief agencies, schools and colleges, industrial, fraternal and mutual benefit associations, group hospitalization associations, community health service organizations and other similar organizations.

Numerous statistical studies pertaining to health and medical care have been conducted in the United States since the beginning of this century. One favorite method used in such studies is the selection of a random sample of the population to be surveyed. In the American Medical Association study of the supply and demand of medical care a different procedure of collecting data was followed, since it was believed that a random sample would not be representative of the total population. Instead of applying a stereotyped formula to the problem, the method of obtaining the desired information was chosen to fit the nature of the problem.

Each county, and in some instances a local community within a county, has its own distinctive method of arranging and providing medical care to the indigent and low income groups. Health departments and relief agencies are organized and operated differently throughout the country. Therefore it was believed to be impossible to select a few counties to represent the methods of distributing medical care throughout the United States. The local means already established to provide and arrange for the distribution of medical care is an important factor in determining the method to be used in collecting the data pertaining to such distribution.

The second objective of the study was to recommend preferable procedures for meeting the needs indicated in the study. Before recommendations for changes in the method of distributing medical care could be made, it was necessary to determine the facts concerning the supply and demand for medical care in each county in relation to local conditions and available facilities.

FORMS USED IN THE STUDY

The forms used in this study for collecting data from various sources of information are familiar to you. Nine different forms and a summary sheet were prepared and distributed to the state medical associations for the use of county medical societies. The county medical societies in most cases appointed a committee to direct the survey and this committee was responsible for collecting and tabulating the data and preparing the summary sheet, one copy of which was sent to the state medical association and one copy to the Bureau of Medical Economics.

This study was not designed to produce figures that could be fabricated into a volume of statistical analyses which might be misused as absolute conclusions to describe the availability of medical care in any locality. The comments and suggestions on the method of distributing medical care and the degree to which available services and facilities were being utilized are more important than a mere knowledge of the number of physicians, hospitals and nurses in each county. Obtaining comments and suggestions on medical care was indicated in our statement of the objectives of the study. It seemed important to know not only where and in what way medical services are available but also what the best informed people thought was the preferable method of eliminating any barriers to the more complete distribution of medical care in a particular geographic area.

Frequently, in making a statistical survey, mathematical formulas and statistical devices are used in collecting and tabulating the data simply because they are considered precise. A mere tabulation of the number of available medical facilities in a particular locality gives no indication of the extent to which such facilities are utilized unless it is also accompanied by information from persons or organizations who provide or arrange for medical services concerning their experiences with the existing methods of distributing these services and facilities.

EXTENT OF COVERAGE

The information collected on these nine different forms was studied, tabulated and summarized by the county committee in charge. The data and comments which were recorded on the original forms were then transferred to the county summary forms provided for that purpose. The greatest value and use of the information obtained in this study should be as a basis for future changes to improve the distribution of medical service.

A total of 862 counties in thirty-eight states with a total population of 49,278,000 were covered by this survey. If we consider persons living in towns of 2,500 population or more as urban, the population covered by this study can be classed as about two thirds urban and one third rural.

VALIDITY OF CONCLUSIONS

The conclusions arrived at from the study of these county summaries by the county committee in charge of the study were not generalizations but specific statements describing the actual experience of the persons responsible for distributing medical care and they were evaluated by a committee familiar with conditions in that particular area.

The amount of information and data contained in each summary sheet varies, just as the facilities and methods of providing medical care to the indigent and low income group varies in each county. The summary sheets contained sufficient data and information to enable the local individuals responsible for the distribution of medical care to discover leads or suggestions for improvements in the distribution of medical service.

Quite a number of committees in charge of these county studies prepared very thorough reports interpreting and evaluating the original data. These reports will serve as a basis for the county medical society to develop a program of improved medical care. These summary sheets and reports are, except for a few special studies, the only compilation of the facts concerning the supply and demand of medical care that have been made in these 862 counties.

STATE REPORTS

One copy of the county summary sheet was sent to the state medical association. This summary sheet then became the basis for a report on medical care for the entire state.

The state medical association's committee then added available material with regard to state institutions that participate in the provision of medical care. A few state medical associations prepared a report of their analysis and conclusions based on the compilation of county summaries and the additional data collected on state institutions. Among the states which made a very complete survey and prepared a state report were New Jersey, Maryland and Delaware.

DELAWARE

The Delaware report describes the available medical facilities and the conditions peculiar to that state and then lists the deficiencies brought out by this survey. In practically every instance these deficiencies were in relation to statewide institutions. Some specific needs indicated were more hospital beds for Negro tuberculous patients and for Negro maternity cases, more institutions for persons with mental diseases and chronic illness, and the care of the aged. Remedies already proposed or being developed to meet the indicated deficiencies were described.

MARYLAND

The Maryland report summarized the needs expressed by physicians, hospitals, welfare and relief organizations, health departments and schools. The physicians believed that there was a need for better classification of the indigent and more

adequate provision of public funds for their care. Hospital officials desired more thorough investigation of patients requesting free hospital service. Health departments and welfare and relief agencies stated that they worked in close cooperation with physicians and hospitals and that they experienced no difficulty in obtaining medical service for needy persons. The summary of the reports from schools showed that pupils examined and found to be in need of corrective medical treatment often failed to receive such treatment because of their parents' indifference or unwillingness to cooperate with school officials and physicians. All sources of information indicated a need for additional medical facilities for persons with chronic illnesses and mental diseases.

NEW JERSEY

One of the most complete and exhaustive state surveys was made by the New Jersey State Medical Society. Information was collected in every county and a summary form prepared including comments and suggestions for meeting existing deficiencies. The report by the state medical society discussed every phase of this study according to the source of information. The data obtained from each particular group were tabulated and analyzed. Conclusions based on these details were presented.

The various state departments which arrange for or provide medical care were considered separately. For example, one chapter described and discussed the facilities available in the state for the treatment of cancer; another discussed the venereal disease clinics. One of the more general conclusions arrived at in the New Jersey study was that hospital insurance was believed to be a great aid in meeting the problem of hospital expenses for the low income group. The New Jersey Medical Society then made further tests of the supply of medical care. In July 1938 the New Jersey Medical Society broadcast a statement by radio and in newspaper stories offering free medical care to any one in New Jersey needing medical care which he had been unable to obtain. In October, three months later, the president of the New Jersey Medical Society announced that only 127 requests had been received and turned over to the proper county medical society. Each request was investigated and medical services were provided where needed. According to the New Jersey Medical Society this investigation revealed that applicants could obtain medical care if they knew how to go about getting it. Many of the applicants had not attempted to obtain the services of a private physician nor had they presented their cases to health departments or relief agencies. Some had already received medical care but were not completely satisfied with it.

PENNSYLVANIA

The State Medical Society of Pennsylvania also made an excellent survey and prepared a well written report of the total area covered. This included fifty-one of the sixty-one counties in Pennsylvania. The report is organized as individual reports from each county. The state medical society committee prepared a short summary of the data and information on a statewide basis but it stated that the statewide report would be of less practical value than county reports. Each county report contained a description of the county, its population, a list of all the persons and organizations who arranged for or provided medical care, and a compilation of the amount of free medical services provided by each group during 1937. Following this there is a discussion of the need for expanding or enlarging certain medical facilities, and of why certain persons had not obtained needed medical care. This report of exact detailed conditions by counties is especially useful for further study of the demand and supply of medical care in each county. One county may have an excellent system of providing medical care to the indigent but such a system may not apply or may not be needed in other counties. Therefore a state report by counties may be of more practical value than a general report of the entire state.

KENTUCKY

The Committee on Medical Economics of the Kentucky State Medical Association prepared a complete report of factual data in relation to medical care in Kentucky. This report, which was published in the August 1939 Bulletin of the Department of Health, contains a description and discussion of the population with regard to growth and economic status, a tabulation of all the medical facilities and organizations which arrange or provide medical services, and vital statistics for the entire state. This report contains a treatment of the same data for each county in Kentucky.

CHICAGO

Certain individual county medical societies in almost all the states conducted thorough surveys and summarized data into a concise and informative report. The Chicago Medical Society deserves special mention for the survey made of the medical care and facilities in Cook County. Every source of information was considered and called on to supply data for this report. Physicians returned 1,603 forms, dentists 370, general and special hospitals eighty-one, nursing organizations eleven, health departments eighteen, a district state health officer one, public and private relief agencies and social workers 285, public and parochial schools fifty-eight, colleges and universities seventeen, industrial organizations and union and benefit associations 258, and pharmacies 242. The complete report describing and discussing data obtained from these many sources makes a book of 268 pages, so organized that information on any particular group or institution can be easily found. Conclusions and interpretations of the Committee on Medical Economics of the Chicago Medical Society, which conducted the survey and prepared the report, are also included. A considerable portion of the report is taken up with individual comments and suggestions that support these conclusions.

OTHER COUNTY SUMMARIES

Some of the other county medical societies which made complete investigations and reports on the supply and need of medical care in their particular area were the Middlesex South District Medical Society in Massachusetts, the Monroe County Medical Society in Tennessee, the Providence Medical Association in Rhode Island, the Washington County Medical Society in Iowa, the Rock County Medical Society in Wisconsin, the Harris County Medical Society in Texas, the Vanderburgh County Medical Society in Indiana and the Marion County Medical Society in Kansas. These county medical societies tabulated the data from every known source and then prepared a concise report stating their conclusions and supporting them with comments as well as stating why they believed their conclusions were valid.

Any one interested in learning how a small medical society whose members are all engaged in rural medical practice made a thorough study of all the factors implicit to the distribution of medical care in a rural area and prepared a concise but still complete report of their conclusions should read the Monroe County Medical Society of Tennessee report. This county medical society of fifteen members had no special facilities or funds to carry out this study, but they experienced no undue difficulty in obtaining complete information from all sources as a basis for their conclusions.

The 614 other county medical societies which have not been mentioned returned summary sheets of the data they collected, including comments and in some cases special reports. All these summary sheets or reports contained specific information concerning medical care in that county.

VALUE OF COUNTY REPORTS

In interpreting data collected in a small area covered by a county there is little need for generalization, since each comment or suggestion can be treated individually. Special local features of distributing and providing medical care can be given the proper place and described in detail. Any claims or statements that medical care is not available can be investigated and a specific remedy suggested and applied.

The general summary based on all the county and state reports prepared by the Bureau of Medical Economics contains tables showing that 623 local medical societies in thirty-eight states conducted the survey in 862 counties which had a total population of 49,278,000. A total of 22,397 physicians and dentists and 16,290 other persons or organizations returned completed forms which were used in the study.

FREE SERVICE FROM PHYSICIANS

The returns from physicians and dentists were not always separated on the county summary sheets. The ratio of returns on the forms which did indicate physicians and dentists made it possible to estimate that about 17,000 physicians reported. These 17,000 physicians stated that they had served 2,927,108 persons without charge during 1937, that is approximately 6 per cent of the population covered by the study, but the total number of physicians reporting was approximately 27 per cent of the physicians practicing in the area. Therefore it can be safely estimated that between 10 and 15 per cent of the population received free service from physicians in the home and office during 1937. These same 17,000 physicians reported that they had donated 2,051,954 hours of free care to patients in the hospital outpatient departments and clinics during the year.

FORMS 1 F

An additional tabulation of the amount of free service rendered by physicians was made from data collected in the forms 1 F. These were actual weekly records kept by the physicians in three different weekly periods during the year and were returned directly to the Bureau of Medical Economics for editing and machine tabulation. According to the figures recorded on 9,936 weekly records, 835,716 patients received medical service in the home or office during one week. This represents an average of eighty-four patients who received some medical service from each physician during a week. A total of 9,840 weekly records of free medical services showed that 134,200 patients received medical services from physicians in the home or office for which no charge was made. This represents an average of about fourteen patients a week for each physician. According to these figures, about 16 per cent of the total number of patients seen in patients' homes or physicians' offices received free service. This percentage does not include patients served free in hospital outpatient departments or clinics or the number of patients who received service and later failed to pay. Previous studies indicate that about 20 per cent of the fees charged were not paid.

This compilation of free services from weekly records of physicians was made entirely separate from the general survey. The results obtained support the conclusions based on the general survey that from 10 to 15 per cent of the population received free medical services from physicians.

HOSPITALS—FREE SERVICE

A tabulation of the number of public charges and the number of free patients cared for in reporting hospitals also was made. Returns from 1,336 hospitals showed that they had cared for 505,128 public charges and 721,216 free patients during 1937. The type of hospital was not indicated in every case, so it was impossible to determine the total number of general hospitals and special hospitals or type of control—governmental, private or nonprofit. Such a breakdown can be made in each county, since the type of hospitals can be easily checked.

The total figures from hospitals can be useful as an indication of the amount of free hospital service, but one is limited in making any general statements concerning free care in hospitals for the total area since the size of the hospitals, the type and the ownership are not available in every instance.

METHOD OF OBTAINING INFORMATION ON LACK OF MEDICAL CARE

Each of the nine different forms used in collecting the data for this study contained a question as to any specific inability to obtain medical care. Each person filling out the form was requested also to supply comments or suggestions concerning any observed lack of medical care and to indicate the method which he believed should be considered in seeking a remedy for such a situation. The answers to these questions are of great significance, since they were directed not only to physicians but to the public health and visiting nurses, health department officers, welfare and relief officers and school officials. The activities of such individuals in each locality should make them aware of any deficiency in the medical facilities or in the distribution of medical care, since they have every opportunity to discover if any person is unable to obtain medical care. Since they are largely responsible for providing or arranging for medical care, they would be aware of any difficulty in furnishing medical care under existing systems of distribution.

Our conclusions on the deficiencies of medical care are based on repetition and consistency of replies from this group. The most significant feature of these replies is their general agreement in describing any local conditions that indicated a lack of adequate medical care or of special arrangements for providing it.

CONCLUSIONS ON LACK OF MEDICAL CARE

According to the expressed opinions of those best qualified to judge, there is no large group of individuals in any part of the surveyed area who were unable to obtain medical services which they desired. The few isolated cases in which individuals had not received needed medical services were usually found to be due to the fact that they either did not want medical service, made no attempt to obtain it or refused to accept free service.

It was evident also from the replies that institutions for the care of persons with mental diseases, chronic illnesses and tuberculosis needed to be increased or expanded. In most cases local programs were being developed to increase the facilities according to the needs and different conditions in each particular area.

Another general conclusion borne out by practically all the replies is that a large number of school children do not receive the medical care recommended after school examinations, owing to their parents' indifference or procrastination. These recommendations for medical services for school children were almost entirely for dental care, removal of tonsils and adenoids, and the provision of eye glasses.

The comments also indicated that most states and counties had not developed a successful plan for handling indigent transients. Such individuals were depending on free services from physicians, dentists and hospitals but in some areas the large number of transients made it necessary that the responsibility for their medical care be assumed by the local government.

These general conclusions based on consistent repetition of comments are useful in that they show clearly the need for developing certain general plans for improving the distribution of medical care.

A careful analysis of the material collected in this survey indicates that the important factor in improving the distribution of medical services is to develop and experiment with a specific program in a small area such as a county or city. There is no way in which a general plan can be prescribed for the whole surveyed area when there are such diversified existing conditions in each county and city. A plan usually works very well in one area because it has been developed to fit the needs and conditions in that area and therefore may not be applicable or beneficial to another area.

A practical solution for the indicated deficiencies in a given community must be developed according to the existing facilities and special conditions indicated in the county survey. Similar surveys to determine progress toward meeting the problems that were revealed in this present study can be made. These later studies will bring out new needs and will furnish suggestions for ways to meet them.

DISCUSSION

CHAIRMAN BARKER: Perhaps you will let me have a moment here to tell you briefly of the pattern we followed in my own small state of Connecticut. We had an idea that, if we could get the state government interested in such a study, provided it could be made under the proper auspices, the results would become a public document rather than a report of what might be accused of being a biased group, the medical profession. We went before the general assembly in 1939 with a rather extraordinary bill which, in the hurly-burly of other things, was passed. A commission is now at work, financed with state funds from the governor's executive budget. It has no definite appropriation. We are at liberty to retain the full time field workers and experts, and we are charged with reporting our observations and recommendations to the general assembly of 1941. That study is now under way. I

am the chairman of the commission making the study. In addition, there is another member of our state society, the superintendent of our largest hospital, a nationally known figure in the field of public health, who is connected with the Yale School of Public Health, another physician who is not a member of the state medical society, a retired public health official and a layman, a member of the minority party in our senate. Our document will be a public document and we shall be given the opportunity at least to recommend to our statesmen the deficiencies that exist in our state.

The Wagner Health Bill

DR. W. C. WOODWARD, Chicago: In the early part of the year the President sent to the House of Representatives a message: "Message of the President of the United States transmitting the annual message on Health Security." The President began: "In my annual message to the Congress, I referred to the problems of health security. I take occasion now to bring this subject especially to your attention in transmitting the report and recommendations on national health prepared by the Interdepartmental Committee to Coordinate Health and Welfare Activities.

"In August 1935, after the passage of the National Security Act, I appointed the Interdepartmental Committee to Develop Health and Welfare Activities. They have reviewed unmet health needs and the desirability of developing a national health program. They shall develop the outlines for such a program."

Then there is the reference to the notorious health conference held in Washington for the purpose of endorsing this particular program. We have these significant words from the President: "The objective of a national health program is to make available in all parts of our country and for all groups of our people the scientific knowledge and skill at our command to prevent and care for sickness and disability, to safeguard mothers, infants and children, and to offset through social insurance loss of earnings among workers who are temporarily or permanently disabled."

There is no distinction there between the attention that shall be given to persons who are able to provide medical services for themselves and those who are not, but "the objective of a national health program is to make available in all parts of our country and for all groups of our people the scientific knowledge and skill at our command to prevent and care for sickness and disability."

The President commended the report of the Interdepartmental Committee.

Those of you who are familiar with the Constitution know that all bills for raising revenue must originate in the House of Representatives. The Social Security Act is an act that proposes to raise revenue, so this message was addressed primarily to the House of Representatives. It was referred to the House Ways and Means Committee. The Committee on Ways and Means had decided that in proposing amendments to the Social Security Act it would limit its amendments solely to those having to do with what we may term economic relief rather than health relief.

Activities then were transferred to the Senate side on the initiative of Senator Wagner. We understood that the senator was engaged in the drafting of a health bill of some kind. We wrote to him, and I appeared at his office on various occasions trying to get in touch with him. I even had a letter of introduction from the Medical Society of the State of New York, but that did not secure contact. In fact, I have never been able to make contact with Senator Wagner regarding this bill. The bill, we learned, was being drafted by his legislative clerk, aided, I know, by various representatives of the Public Health Service, the Children's Bureau, the Social Security Board and outside agencies. I had no knowledge of the bill until the day it was introduced in the Senate. Then we had a carbon copy of it twenty-four hours or more in advance of the general public, but no chance to suggest amendments. That bill is supposed to implement this report of the Interdepartmental Committee. [Dr. Woodward then outlined the Wagner bill, S. 1620.]

Then came the hearings before the Senate subcommittee, which has issued a preliminary report. You may recall that the House of Delegates of the American Medical Association proposed that grants-in-aid for health and medical services be given to any state on proof of need and that some proper agency be established to determine whether need had or had not been proved. The committee, however, unfortunately has stated the case very differently in its preliminary report. The committee said: "Some witnesses have objected to the grants-in-need pattern embodied in the bill. They have urged that there should be a federal officer with authority to approve aid to some states in dire need of assistance and withhold it from other states with lesser need. However, the questioning by the committee brought out that, the more closely these witnesses inspected the procedure necessary for an equitable grant-in-aid program, the closer they approached to just such a pattern as is embodied in the bill, with some divergence of opinion as to the amount of money to be authorized or as to the details of the standards to be followed in making allotments."

I sat through all the hearings. I heard, I think, practically every word that was said, and I challenge any one to show anywhere in the record any proposal that there should be a federal officer to pass on the needs of the states. But the American Medical Association recommended a federal agency which might be similar to the Reconstruction Finance Corporation; that might, for that matter, be the Reconstruction Finance Corporation itself, because the proposition is altogether the determination of financial need. Then there was certainly no reference to provide that there should be that distinction between those in need and those in lesser need. It was a question of need, proved to the satisfaction in the first place of the officer who is familiar with the program proposed and, second, to the proper financial agency.

In the course of the hearings, questions were repeatedly asked, often by Senator Wagner, sometimes by others: "Can you point out anything in this bill that will permit the state agencies to whom grants are to be given to provide medical services for persons of ample means to provide them for themselves?" Not one of the witnesses who appeared could point out anything in the bill that would permit a state health officer, or any other state officer, to provide hospital and medical services for rich people. But, as a matter of fact, there is absolutely not one word in the bill that limits the benefits to be conferred to persons who are poor, or even to persons in moderate means. The benefits that this bill proposes to offer are available to every one, from the richest millionaire in the community to the poorest citizen.

Here is a rather interesting point of view that the subcommittee has taken: "The appropriation sections of titles V, VI, XII and XIII of the bill include, as being especially among the purposes of the authorization, to assist rural areas, or, in title XIII, individuals suffering from severe economic distress. Some witnesses would go further in this direction. They recommend that the bill be amended so as to limit exclusively to needy or to medically needy persons the health services, financially aided by grants-in-aid contemplated by the bill. It is not always made clear, however, precisely how one or the other of these groups is to be defined without limiting the effectiveness of the health programs in the states so as to defeat the purpose of the bill for the improvement of the health of the population. We have already reviewed the overwhelming body of evidence submitted at our hearings showing that medical costs may be burdensome and medical care inadequate to tens of millions of our people in income brackets above the level of those who are in receipt of any form of public assistance.

"Any useful definition of the medically needy must recognize that a large proportion of the entire population may be greatly burdened by sickness costs and may at any time be among the medically needy, even though otherwise self supporting. Furthermore, many health problems transcend geographic, economic or social boundaries, for some health service must obviously be made available on a community-wide basis to all families and be paid for from general tax funds."

Then they proceed: "Other witnesses, representing large groups of population, have emphasized the inadequate services received by self-supporting families and individuals of small incomes. They have recommended that the bill be amended to require as a condition for the receipt of federal aid specific health insurance programs in the states to meet the needs of self-

supporting persons with incomes up to $3,000, or even a higher limit." Then they point out the objection that may be raised by those persons to have anybody inquire into their ability to pay.

Those are the views that the subcommittee itself has set forth, and I think we shall have to be prepared to meet them. Some persons whose legislatures meet annually or who have a session only every other year have gotten the impression that in Congress a bill expires at the end of the session. That is not the case. It expires at the termination of the Congress. So this is still before the committee.

The bill has been demonstrated to be an entirely unsatisfactory and irrational and unreasonable bill. We are assured that the subcommittee will present a new bill sometime during the coming session of Congress. We have solicited the opportunity of participating in the framing of any such new bill. Up to the present, however, no opportunity has been afforded to join in the drafting of the proposed new bill or new amendments.

The burden of seeing that the bill that is to be enacted during the coming session of Congress, if any bill is enacted, is a sound bill is, more than ever, going to fall on those who represent state medical societies. You who are back home, who can make contacts directly and indirectly with your own congressional delegations, ought to make such contacts before they return to Washington in January. You ought to represent to them the readiness of the American Medical Association to go along in any rational program, and its eagerness to do anything it can to make any program that may be proposed a rational program—which the Wagner Health Bill is not!

The Platform of the American Medical Association

Dr. Morris Fishbein, Chicago: The Board of Trustees has asked me at this point to interpolate a statement relative to a proposed platform for the Association.

The Board of Trustees recognizes that the policies adopted by the House of Delegates prevail. Therefore the platform which it sets forth is derived from sessions of the House of Delegates.

Following the report of the reference committee of the House of Delegates, twenty-two points in relationship to the Wagner bill were adopted by the House of Delegates. These represented the basis of the appearance of your representatives before the hearings of the subcommittee in Washington. In the report of those twenty-two points far more attention was given by the press of the country generally and, indeed, by physicians as well, to the opposition to the Wagner bill than was given to the five or six points which concluded and which were wholly constructive. These recognized that the American Medical Association, representing some 115,000 physicians, has a definite obligation to the people of this country in relation to the provision of medical service.

We have gained great objectives during the period which Dr. Sleyster so aptly characterized as the five persecution years. The medical profession of this country is capable of defending its faith in the principle of the private practice of medicine as the main principle in the development of medical practice in this country. We are not opposing now; we are asking the government to go forward with the medical profession in attaining a wider distribution of medical and preventive medical services based on actually demonstrated needs in various communities of the country. [Dr. Fishbein then presented the platform of the American Medical Association and the discussion as printed editorially in The Journal November 25, p. 1966.]

In a recent trip which I took through the Western states I learned of certain bills brought up in Western legislatures asking them to match federal appropriations. Federal officials came out to solicit those state legislatures to pass those bills with the wording developed in Washington, in order that Washington might then give to the state the money Washington had. In other words, the Congress appropriates the money, then federal agencies go out and sell to the states the idea of spending the money. The states may not ask for the money in the first place and may not want the money; sometimes it would be a considerable burden on those states to spend the money efficiently. That situation must be avoided in relation to any health legislation developed in this country.

Local determination is fundamental to the right of the individual states and communities to determine for themselves what their needs are and not to have their needs sold to them by the federal government. It is basic in maintaining the kind of medical practice, the kind of preventive medical practice that has prevailed in this country for so many years and which has given us the extraordinarily satisfactory conditions we have today. In the same message the President sent to the Congress, to which Dr. Woodward has already referred, the President pointed out that we have attained the lowest sickness and death rates in our history. Just yesterday the United States Public Health Service made the statement that our maternal mortality rate has dropped within recent years 23 per cent below former levels. This represents a tremendous gain in the control of maternal mortality. In other words, this country is not in the throes of a serious emergency, with people dying right and left for lack of medical care, with innumerable mothers' lives being wasted for lack of medical care.

There has been a vast propaganda in an endeavor to sell the national health program, so called, to the people. Now perhaps the federal agencies that have done so much to sell the program have begun to see the futility of their method of approach. Now they have gone back to the point where they sell themselves to the people instead.

HOSPITAL FACILITIES

If you were at the hearings in Washington, you got the idea that there has been no building of new hospitals in recent years in the United States. With PWA funds and WPA labor, and under the Federal Works Administration and innumerable other administrations, they have been building hospitals to a considerable extent. Recently Morrill, in analyzing hospitals built with federal funds in Michigan, showed that eight hospitals so built were unnecessary, showed that not one of the hospitals could function especially efficiently as a hospital, having no specialists, no laboratory, no x-rays and in many instances being close to large cities with magnificent hospital facilities. He showed in addition that not one of the communities in which the hospitals were put down could maintain those hospitals without something like $5 to $8 per capita annually as a tax on the local community for the maintenance of the hospital, something far beyond the ability of any small community in the state of Michigan to bear. Those are examples of the fact that there has been vast spending, uncontrolled, unscientific, uneconomic and unwarranted.

What we need is, first of all, utilization of space now existing in our nonprofit, voluntary hospitals—perhaps the best in the world—space which is up to now from 25 to 30 per cent not utilized. The propaganda in relationship to the building of hospitals with federal money is probably the worst of all the propaganda associated with the national health program. Obviously, what we stand for there is the kind of experimental programs that are already being attempted in many places and in many states, led by the medical profession itself, in an endeavor to gain under the American system of practice a wider distribution of medical service to all the people. Such experiments, properly controlled by physicians in the community according to the standards set by the American Medical Association for the quality of service, we can encourage to the utmost.

The introduction into this nation of a federal security plan whereby the nation itself, as a federal agency, will step intimately into the sickness and life of every person in the country will be the first step in the breakdown of American democracy. Indeed, all forms of security, compulsory security, even against old age and unemployment, represent a beginning invasion by the state into the personal life of the individual, represent a taking away of individual responsibility, a weakening of national caliber, a definite step toward either communism or totalitarianism. The people of this country today have begun to awaken to the insidious approach of such new forms of government.

Present Horizons

Dr. Austin A. Hayden, Chicago: The matters that have been presented this morning show clearly the differences of opinion in regard to the national health survey and to the survey that has been conducted by the American Medical Association. I must pay tribute as a private practitioner of medicine to the

efforts that Dr. Braasch and his committee have put forth in making that survey. I think it is one of the most helpful things the Association has ever undertaken. It is not completed by any means.

The need and the demand are the points by which principally these various reports differ. The need will never be completely met. All of the health surveys that have been made, of course, show greater need than is demanded. Few, if any, demands for medical aid have been turned down by physicians in physicians' offices, in physicians' clinics or in any place in which they work.

The Board of Trustees has recently held a meeting with the hospital groups, the American Hospital, the Catholic Hospital and the Protestant Hospital associations. A similar meeting has been held with the American Dental Association and with the American College of Physicians. Just yesterday a meeting was held with the American College of Surgeons, a most harmonious meeting. Think of the change that has occurred in the attitudes of various organizations in the past ten years. In that meeting every one desired that duplication be avoided by the two organizations, that every help should be given one to the other so that hospitals will not be examined too frequently to say whether or not they are proper places for sick people to be.

The platform is a positive program, designed to be applicable to every section of the country.

DISCUSSION

MR. C. S. NELSON, Ohio: I should like to direct a question to Dr. Woodward. What will be the attitude of the American Medical Association with respect to specific amendments to whatever bill is presented to Congress, whether it is the Wagner bill, a revised Wagner bill or some new bill? Before the last session every member of Congress in Ohio was interviewed by a committee of physicians. We paid particular attention, of course, to Senators Taft and Donahey. We had a definite understanding with most of them and, I think, if the Wagner bill had come to a real issue on the floor, we would have had an almost unanimous vote against it from the Ohio delegation. We have found in Ohio—and we are no different from other states, although I think we have a reasonable degree of success in legislative activities—that amendments are pretty valuable. Sometimes you can cure a bill pretty quickly with amendments. I think that is up to some body of the American Medical Association.

DR. OLIN WEST, Chicago: Perhaps some things need to be said that have not yet been said with respect to the status of this legislation. For the first time in several years the American Medical Association has been given assurances from official sources, including a member of the subcommittee of the Committee on Education and Labor which conducted the hearings on the Wagner bill, that the representatives of the organized medical profession will be given opportunity to confer with that committee and perhaps with others who may be interested in the objectives of legislation designed to extend public health and medical service. I have within the last few days received a very encouraging letter from Senator Murray. Apparently there have been no meetings of the subcommittee of the Committee on Education and Labor of the Senate since the hearings on the Wagner bill were closed. Senator Murray specifically states that there will be no further meetings of the committee until some time in January. There are those who are constantly urging the American Medical Association to introduce a bill of its own. There are those who did insist for a considerable time that we should amend the Wagner bill in its various sections. It is my personal opinion that that would have been highly inadvisable. For the last ten years or more ardent proponents of compulsory sickness insurance have utilized their utmost endeavors to force the American Medical Association into the position of having introduced legislation in the Congress of the United States to provide for a great, comprehensive system of voluntary sickness insurance that would be, after all, politically controlled. It would be the first and the inevitable first step toward the enactment of other legislation providing for compulsory sickness insurance. I think we have been crippled by the assumption of a defeatist attitude on the part of many of our own members. I don't believe there is any occasion for the assumption of any defeatist attitude. The principles for which organized medicine stands are strong enough and meritorious enough, humane enough and sound enough to deserve the support of every physician and of every intelligent citizen.

DR. EDWARD H. CARY, Dallas, Texas: The gentleman from Ohio raised a question which I think was embarrassing to all of us in Washington. Whenever a bill comes up in Washington, written by any one and presented, if you go there to a hearing the man who is interested in that bill is going to run you up a tree to find out "How would you amend this bill to make it satisfactory?" If you are not prepared to amend the bill, he will say "Well, you are just against all legislation." In defense of the position of our committee that went to Washington, I would say that I called on several senators, and one commended us for not being drawn into the position of trying to amend the bill. He said "You would have been hopelessly involved and you would have lost if you had tried to amend that bill; you were wise not to do so." That happens to be an expression from one of the senators on the subcommittee. This is a complicated question. The American Medical Association cannot write a bill and cannot present a bill tagged as a bill of the American Medical Association. We have a positive platform. We must have a definite understanding with Dr. McCormack, Dr. Underwood and many of our friends who are public health men. From a personal standpoint, there should be men in the Senate that we know, or men in the House of Representatives that we know—that some of you know—who think along the same lines as we think, who appreciate the platform as a good document, sound Americanism and sound in policy. Some of them ought to be able to write a bill that would reflect the principles in which we believe.

DR. A. T. MCCORMACK, Louisville, Ky.: I think I feel with you, especially those of you who have had any experience in legislative matters, an entirely hopeful attitude as a result of the splendid statement of principles that has been presented to us this morning. It is natural for us as a profession to be conservative. We know tried methods in medicine. We know that the practice of medicine in the United States has been successful in giving us the best health conditions and the best medical service that there is on the globe. Our objective is to do some of the things that have been left undone and do them in some of the spots which have not yet received the beneficence of our science. Legislation is going to be proposed. You have here the principles adopted and specific instructions as to what the amendments should be to make it conform to these principles. We can go to the American people with these principles and secure their support for them because they are constructive. If we really and seriously mean that we are for legislation that will effectuate these purposes, then we can win any fight in Congress. I don't think there is any question that we can defeat the Wagner bill at any time. I think it would have defeated itself if enough members of Congress had ever read it, because it was hopelessly impossible. It couldn't have been administered. It couldn't have been operated. It would have been a futile expenditure of money and would have caused irreparable damage and loss of impetus to the whole public health and the whole medical service. Here today we have again established ourselves firmly on the basis and foundation of a program that is right. Let's stick to it. Each of us is a secretary of a state medical association. In your state, if your health department doesn't conform to your policies, it is the fault of the state medical association of your state because it hasn't done anything about it. If your medical profession wants to control public health policies in your state, all you have to do is to assume that control. Every now and then I hear somebody say that the health officers of this country are going to dominate the American Medical Association. There are four of us in the House of Delegates and there never have been five even when West used to be there as state health officer. During that time our average brain power was much higher than it is now.

DR. HOLMAN TAYLOR, Fort Worth, Texas: I want to make inquiry of those in charge as to the nature or character of the distribution of the results of this survey of medical services. Anticipating a demand, we have sought to make up 100 packages on the subject of socialized medicine. Among these packages we have been seeking to place the results of this survey. In Texas, schools are mainly interested in what the conditions are

in Texas. To those who make inquiry on the subject we have a little summary our office made of the survey that was made in Texas. Will these reports be so distributed that those of us who want them can get a reasonably large number of copies for distribution? Concerning the eight points, I want to acclaim those as a fine statement of principles. I think it would be good if we could work in here, perhaps under 5, attention to the fact that a man is not medically indigent until he is not able to buy medical service, and the facts in the case must be determined locally and not nationally.

Dr. Olin West, Chicago: There were all sorts of groups that participated in the surveys in the individual states, including physicians, dentists, pharmacists, nurses, public officials, hospital administrators and staffs and civic clubs. In most instances the conclusions arrived at by the representatives of these various groups were exactly the same. Pharmacists, social service workers, civic clubs, health officers, public officials agreed in many of the items covered by this survey. We hope to have this report soon available. I don't know how big a volume it will be, but I do want to say to you that in case of need we shall try to provide you with something that may be helpful to you. If we can provide you with the whole report, we shall try to do that.

Dr. W. C. Woodward, Chicago: A question was asked as to amendments. I want to emphasize that the proper way to propose a proposed bill or proposed amendment would be for those who are interested to sit around a table and talk the matter over and agree as far as they can agree, and agree to disagree where they cannot agree, and go before Congress in that way. The difficulty is that the opposition in this case, if I may call it the opposition, is apparently doing everything it can to prevent a conference of this sort. I have before me a copy of the program of the American Association for Labor Legislation which is to meet in Philadelphia December 27, 28 and 29. I find that James E. Murray, United States Senator from Montana, chairman of the Hearing Committee on the Health Bill, is to talk on the latest proposals for a National Health Program. It is obvious that he is going to have some information assembled before the 28th.

(To be continued)

OFFICIAL NOTES

THE NEW YORK SESSION

Special Features Authorized for the Scientific Exhibit

Several features have been authorized by the Committee on Scientific Exhibit for the New York session:

Special Exhibit on Fractures under auspices of a committee composed of Dr. Kellogg Speed, chairman, Chicago; Dr. Frank D. Dickson, Kansas City, Mo., and Dr. Walter Estell Lee, Philadelphia.

Special Exhibit on Lame Backs under the auspices of a committee composed of Dr. Frank R. Ober, chairman, Boston; Dr. Carl E. Badgley, Ann Arbor, Mich.; Dr. J. Archer O'Reilly, St. Louis; Dr. Arthur Steindler, Iowa City, and Dr. Philip D. Wilson, New York.

Special Exhibit on Fresh Pathology under the auspices of a committee of which Dr. Harrison S. Martland, Newark, N. J., is chairman.

Exhibit symposiums on heart disease and peripheral vascular disease, under the guidance of committees headed by Dr. Thomas M. McMillan, Philadelphia, and Dr. Norman E. Freeman, Philadelphia.

In addition to the foregoing, the usual exhibits in conjunction with the fifteen sections of the Scientific Assembly will be shown. Applications for space will close February 1. Application blanks may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

WOMAN'S AUXILIARY

California

At the autumn meeting of the auxiliary to the Los Angeles County Medical Association in Los Angeles Dr. George D. Maner discussed pending legislation of interest to the medical profession.

Mrs. Frederick N. Scatena, president, auxiliary to the California Medical Association, addressed the auxiliary to the Marin County Medical Society in Fairfax recently on the history of the auxiliary.

Georgia

An auxiliary to the Fourth District Medical Society was organized at a recent meeting in La Grange. Mrs. Kenneth Grace was elected president. Mrs. Eustace A. Allen, president of the auxiliary to the Medical Association of Georgia, addressed the group on the aims and objectives of the auxiliary.

The auxiliary to the Tift County Medical Society was organized recently in Tifton. Mrs. C. A. Fleming was elected president.

At the September meeting of the auxiliary to the Fulton County Medical Society in Atlanta Dr. Wadley Glenn reported on his recent world tour, and Dr. Edgar H. Greene, president of the Fulton County Medical Society, told of plans for the new building for the society. At the October meeting of the auxiliary Dr. Jack Norris spoke on "Milk in Relation to Health," and Mrs. W. M. Dunn presented material selected from *Hygeia*.

The semiannual meeting of the auxiliary to the Fifth District Medical Society was held at the Academy of Medicine in Atlanta October 5. Dr. George H. Semken, New York, spoke on "Women's Interest in Cancer," and Dr. William H. Myers, president of the Medical Association of Georgia, spoke on "Solving the Cancer Problem."

Kansas

The chief objective of the auxiliary to the Shawnee County Medical Society this year is to increase subscriptions to *Hygeia*.

Mrs. Frank E. Coffey, chairman of the printing and supplies committee of the auxiliary to the American Medical Association, was speaker at a meeting of the auxiliary to the Central Kansas Medical Society in Hays recently.

Mrs. C. D. Korsar, chairman of the Hygeia Committee of the auxiliary to the Kansas Medical Society, was speaker at the autumn meeting of the auxiliary to the Cloud County Medical Society in Concordia.

New York

The second annual Health Institute of the auxiliary to the Medical Society of the County of Kings was held in Brooklyn October 10. Speakers were Dr. Philip I. Nash, president of the Medical Society of Kings County; Dr. Charles Solomon, chairman, subcommittee on food and drugs of the Public Health Committee; Dr. Walter Bromberg, psychiatrist in charge, Court of General Sessions, New York City Police Department; Dr. Adele Streeseman, chairman, Advisory Council to the Woman's Auxiliary of Kings County Medical Society; Dr. Jean A. Curran, Long Island College of Medicine; Dr. Herbert R. Edwards, director, tuberculosis division, department of health; Dr. Thomas A. McGoldrick, medical director, St. Anthony's Hospital; Dr. Foster Murray, director of tuberculosis, Kingston Avenue Hospital, and Dr. Eugene R. Marzullo, chairman, Public Health Committee. The Health Institute was presented by the auxiliary as its contribution toward health education. Representatives of the board of health and the Brooklyn Tuberculosis and Health Association presented exhibits and demonstrations.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—Dr. Ceasar G. Cahen, for twenty-seven years chief surgeon of the French Hospital, Los Angeles, was presented with a diploma November 4 designating him chief consulting surgeon of the hospital for life.——Dr. Ruggles A. Cushman, Cloverdale, has been granted a retired membership in the California Medical Association.

Society News.—Dr. Joel J. Pressman showed a motion picture study of the larynx before the Los Angeles Society of Ophthalmology and Otolaryngology at a meeting December 18; Drs. Isaac H. Jones and William T. Grant discussed "The Elsberg Precision Measurements of the Sense of Smell."——Among others, Dr. Ernest M. Hall spoke before the Los Angeles Heart Association December 13 on "Etiology of Calcified Nodular Aortic Stenosis."

CONNECTICUT

Dr. Putnam Lectures on Epilepsy.—Dr. Tracy J. Putnam, director of services of neurology and neurosurgery, the Neurological Institute of the Columbia-Presbyterian Medical Center, New York, delivered the second annual lecture to be given before the faculty and students at Yale University School of Medicine, New Haven, December 1, under the auspices of the Yale chapter of Nu Sigma Nu. His subject was "Modern Concepts of Epilepsy and Its Treatment."

DELAWARE

Society News.—Dr. Edward H. Richardson, associate professor of gynecology at the Johns Hopkins University School of Medicine, Baltimore, addressed the New Castle County Medical Society, Wilmington, November 21 on "Use of Hormones in Gynecology."

DISTRICT OF COLUMBIA

Director of Venereal Disease Control.—Dr. George M. Leiby, Raleigh, for the last three years director of the division of venereal disease control of the North Carolina State Department of Health, has been appointed as the first full time director of the venereal disease service for the District of Columbia.

Society News.—Dr. Jesse G. M. Bullowa, New York, addressed the George Washington University Medical Society October 21 on "The Doctor's Responsibility to Pneumonia Patients."——At a meeting of the Georgetown Clinical Society November 21 Dr. Harry Zehner spoke on "Cardiology."——Dr. Norvell Belt discussed "Testicular Tumor with Endocrine Disturbance" before the Clinical Club of Washington November 7.——Among the speakers before the Washington Society of Pathologists at the Army Medical Museum recently were Drs. Virgil H. Cornell on "Undifferentiated Small Cell Carcinoma of Small Intestine" and George Tolstoi, "Granulosa Cell Tumor of the Ovary."——Included among the speakers before the Washington Ophthalmological Society November 6 was Dr. John W. Burke on "Field Changes Following Satisfactory Filtration Operation for Glaucoma."——Dr. Walter E. Dandy, Baltimore, addressed a meeting of the medical and dental officers of the navy on duty in the District and vicinity at the Naval Medical School December 4 on "Head Injuries."

GEORGIA

Jonte Equen Memorial Lecture.—Dr. Harris P. Mosher, emeritus professor of laryngology and Walter Augustus Lecompte professor of otology, Harvard Medical School, Boston, will deliver the third Jonte Equen Memorial Lecture in Atlanta January 26 before the Fulton County Medical Society.

New Chair of Surgery.—The endowment of the J. B. Whitehead chair of surgery at Emory University School of Medicine has been announced in the *Bulletin* of the Fulton County Medical Society. The new position was made possible by the gift of $250,000 by the Joseph B. Whitehead Foundation.

Special Society Elections.—Dr. John L. Elliott, Savannah, was elected president of the Georgia Tuberculosis Association at its annual meeting in Alto in November.——At a meeting of the Georgia Industrial Surgeons' Association recently in Brunswick Dr. Robert L. Rhodes, Augusta, was chosen president; Dr. Richard E. Newberry, Atlanta, vice president, and Dr. John W. Simmons, Brunswick, secretary-treasurer.

Society News.—At a meeting of the Macon Medical Society of Bibb County in Macon recently Dr. Milford B. Hatcher, Macon, discussed "Treatment of Burns with Skeletal Support in Severe and Extensive Burns of the Lower Extremity."——Dr. Julian K. Quattlebaum read a paper entitled "Cancer of the Stomach" before the Georgia Medical Society in Savannah recently and Dr. Elzie N. Gleaton presented a case of "Sarcomatosis in a Baby One Month Old."——Dr. Joseph H. Boland gave a clinical talk on football injuries before the Fulton County Medical Society, Atlanta, November 16 and Drs. Carter Smith and Henry C. Sauls discussed "Coronary Occlusion—A Clinical and Electrocardiographic Study of 100 Patients." All are from Atlanta.

ILLINOIS

Personal.—Dr. Paul H. Harmon, formerly director of the crippled children's bureau for the state department of welfare of Illinois and instructor in orthopedic surgery at the University of Chicago, has been appointed to the staff of the Guthrie Clinic and Robert Packer Hospital, Sayre, Pa., as orthopedic surgeon, effective January 1.

Stop-and-Go Lights at Postgraduate Conference.—At a postgraduate medical conference in Champaign December 7 an ingenious device was used to assist speakers in staying within the twenty minutes allotted for papers. A stop-and-go light on the table showed green as the speaker began his address, turned yellow when three minutes was left and red when the twenty minutes was at an end. The apparatus was made by local men and, according to the secretary of the state medical society, Dr. Harold M. Camp, Monmouth, it is recommended for keeping speakers from running over specified time limits. The Champaign conference was the second in a series sponsored by the state medical society; 208 physicians representing sixty-five cities and towns in thirty counties attended.

Chicago

Dr. Heiser to Give Public Lecture.—Dr. Victor G. Heiser, New York, will address the next public meeting of the Chicago Medical Society January 3 at the Chicago Woman's Club, on "Will There Be Another Smallpox Epidemic?"

Society News.—At a meeting of the Chicago Gynecological Society December 15 the speakers included Drs. Ralph E. Campbell, Madison, Wis., on "Angular Pregnancy"; Louis Rudolph, "Pseudo-Uterus Bicornis," and Morris Edward Davis, "Stilbestrol, a New Synthetic Organic Estrogen: A Clinical Study."

Society Branch Meetings.—At a meeting of the North Shore Branch of the Chicago Medical Society December 5 Dr. William Barry Wood Jr., Boston, spoke on "Treatment of Pneumococcic Pneumonia." Dr. Howard K. Gray, Rochester, Minn., addressed the North Side Branch December 7 on "Problems Associated with Surgery of the Biliary Tract." The Evanston Branch was addressed December 7 by Dr. Henry C. Sweany on "Pathogenesis of Tuberculosis, Municipal Tuberculosis Sanitarium."

INDIANA

Study of Hunting Accidents.—With a view to reducing hunting accidents, a survey of these accidents is being made under the direction of Virgil M. Simmons, commissioner of the state department of conservation. Game wardens have been provided with special forms and will call on physicians in an effort to assemble data on persons whom they have treated who have been involved in hunting accidents. Questions included in the forms cover such subjects as the nature and results of the injuries sustained, type of firearms involved, style and color of various articles of clothing worn, whether the accident occurred under heavy cover or in open fields, whether the accident involved more than one person and a statement explaining how the accident occurred. The study has been undertaken as a means of determining the major hazards of hunting.

Society News.—A symposium on diseases of metabolism was presented before the Indianapolis Medical Society November 28 by Drs. William E. King, James O. Ritchey, Marion R. Shafer, Brandt F. Steele and Harold F. Dunlap. The

society was addressed by Dr. James S. McLester, Birmingham, November 7; his subject was "Nutrition and Present Day Living." Drs. Edwin W. Dyar Jr., Robert M. Dearmin and Russell A. Sage discussed "Head and Face Pain from the Standpoint of Ophthalmology and Otolaryngology" before the society December 19. Dr. Edward C. Rosenow, Rochester, Minn., addressed the society December 12 on "Experimental and Clinical Studies on the Relation of Streptococci to Various Diseases."——Dr. William B. Tucker, Chicago, addressed the Tippecanoe County Medical Society in Lafayette October 17 on "Primary Carcinoma of the Lungs."——Dr. Carl P. Huber, Indianapolis, discussed "Bleeding in Pregnancy and Labor" before the Northeastern Indiana Academy of Medicine in Kendallville November 16.——Dr. Henry J. John, Cleveland, addressed the Muncie Academy of Medicine November 14 on "Diabetes and the Relation to It of Some Metabolic Diseases." Weston A. Price, D.D.S., Cleveland, addressed the academy December 12 on "Nutrition and Modern Degeneration, Physical, Mental and Moral."——The LaPorte County Medical Society was addressed in Michigan City November 16 by Dr. Arthur Earl Walker, Chicago, on "Early Manifestations of Intracranial Lesions."——At a meeting of the Gibson County Medical Society in Princeton November 13 Dr. Max Cutler, Chicago, discussed the diagnosis and treatment of cancer.——The Wayne-Union Counties Medical Society was addressed in Richmond November 9 by Dr. Richard M. Davison, Chicago, on "Surgical Treatment in Pulmonary Tuberculosis."

IOWA

Personal.—Dr. James Frederic Clarke, Fairfield, was honored at a banquet given by the Jefferson County Medical Society November 9 in recognition of his completion of fifty years in the practice of medicine.——Dr. Edwin N. Heshacher, formerly of Minneapolis, has been placed in charge of the Polk County health unit.

KANSAS

Personal.—Dr. Harry W. Davis, Plains, was recently appointed health officer of Meade County.——Dr. Charles F. Menninger, Topeka, was recently made an honorary member of the Shawnee County Medical Society in observance of his completion of fifty years in the practice of medicine.

Society News.—At a meeting of the Butler-Greenwood County Medical Society in El Dorado recently Dr. Ralph L. Drake, Wichita, discussed brain tumors.——Dr. John L. Lattimore, Topeka, addressed the Clay County Medical Society in Clay Center recently on "Newer Laboratory Methods and Their Interpretation."——Dr. Benjamin P. Smith, Neodesha, discussed diabetes before the Wilson County Medical Society at a meeting in Neodesha recently.——At a meeting of the Wyandotte County Medical Society, Kansas City, December 19 the speakers included Drs. Thomas G. Orr, Kansas City, Mo., and Galen M. Tice, Kansas City, on "Carcinoma of the Breast."——The Sedgwick County Medical Society was addressed in Wichita, November 21 by Dr. Edward H. Hashinger, Kansas City, Mo., on "Causes and Treatment of Obesity" and November 7 by Drs. Christian A. Hellwig and Frank L. Menehan, Wichita, on "Coronary Sclerosis" and "Embryoma of the Kidney" respectively.

KENTUCKY

District Meeting.—The fifth and tenth councilor districts held a joint meeting in Frankfort December 13 with the Franklin County Medical Society as host. At an afternoon session Drs. John Harvey, Lexington, and DeLou P. Hall, Louisville, presented papers on "Sulfapyridine in the Treatment of Pneumonia" and "Carcinoma of the Colon" respectively. In the evening Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, made an address on "American Medicine and the National Government" under the auspices of the county society and the Frankfort Forum Club.

Society News.—Dr. Vilray P. Blair, St. Louis, addressed the Jefferson County Medical Society, Louisville, November 20 on "Treatment of Cancer of the Face."——Dr. Kenneth W. Brumback, Cynthiana, addressed the Harrison County Medical Society, Cynthiana, November 6 on "Diagnosis and Treatment of Lobar Pneumonia."——Dr. Arthur T. McCormack, Louisville, addressed the Boyle County Medical Society, Danville, December 19 on "Medical Social Security."——Drs. Milton S. Lewis, Nashville, and George E. Pryor Jr., Hopkinsville, addressed the Christian County Medical Society in Pembroke November 14 on "Diagnosis and Management of the Posterior Position" and "Diagnosis and Management of the Goiter Case" respectively.——At a meeting of the Muldraugh Hill Medical Society in Elizabethtown December 14 the speakers were Drs. Harry S. Andrews, Louisville, on "Recent Methods of Treating Pneumonia"; John W. Fish, Louisville, "Common Eye Injuries, Their Diagnosis and Treatment"; Clyde C. Carroll, White Mills, "Differential Diagnosis of the Acute Exanthemata," and John M. English, Elizabethtown, "Ethics of the Medical Profession."——Drs. William N. Lipscomb and Rufus C. Alley, Lexington, addressed the Bourbon County Medical Society, Paris, November 16 on "Anemias of Childhood" and "Practical Management of Rectal Abscesses and Fistulae" respectively.

LOUISIANA

Personal.—Dr. William K. Evans, Lake Providence, has been appointed health officer of West Carroll Parish, succeeding Dr. William J. Buffaloe, Oak Grove, who resigned to engage in private practice in North Carolina, it is reported.

MARYLAND

Society News.—At a joint meeting of the Medical Society of the District of Columbia and the Baltimore City Medical Society December 1 in Baltimore the speakers were Drs. Wallace M. Yater, Washington, D. C., on "Pathogenesis and Prognosis of Bundle Branch Block" and Thomas Bradley, Washington, D. C., "Management of Intractable Pain."

Medical Board for Occupational Diseases.—The governor recently appointed a state medical board for occupational diseases with the following members: Drs. Raymond Hussey, chairman, Nathan B. Herman and John W. Pierson, all of Baltimore. The creation of the board was provided for in the new state occupational disease law regulating compensation in this field.

Seminars on Industrial Hygiene.—The committee on industrial health of the Medical and Chirurgical Faculty of Maryland has recently inaugurated a series of sixteen seminars on industrial hygiene. The series opened with introductory remarks October 25 by Dr. Carl M. Peterson, Chicago, Secretary of the Council on Industrial Health of the American Medical Association. Dr. John M. McDonald, director of the bureau of occupational diseases of the Baltimore health department, spoke on "Occupational Health Hazards of the Industries in Maryland." Other speakers included:

Theodore C. Waters, Baltimore attorney, October 31, The Formulation of Occupational Disease Legislation.
Henry D. Sayer, former commissioner of industrial diseases of the state of New York, November 7, The Operation of a State Industrial Commission.
Thomas N. Bartlett, manager, claim division, Maryland Casualty Company, Baltimore, November 21, The Insurance Aspects of Compensation for Occupational Diseases.
Walter F. Perkins, vice president, Koppers Company, Bartlett Hayward Division, Baltimore, December 5, Industrial Health: An Employer's Point of View and Attitude.
John P. Frey, president, metal trades department, American Federation of Labor, Washington, D. C., December 19, Industrial Health: The Employee's Point of View.

The program for January, February and March is not yet available. It is planned to give attention to the hazards of carbon monoxide and dusts and to the general problems of preventing and controlling the occupational diseases.

MASSACHUSETTS

Personal.—Dr. Clarence G. Lane has been promoted to be clinical professor of dermatology at Harvard Medical School and Dr. Francis R. Dieuaide to be associate professor of medicine.——Dr. Frank M. Vaughan, Boston, was recently appointed a member of the state board of registration in medicine.

Free Public Lectures.—A series of free public lectures on medical subjects will begin January 7 at Harvard Medical School. Lecturers include the following members of the faculty:

Dr. Chester M. Jones, January 7, Digestion and Indigestion.
Dr. Charles C. Lund, January 14, Serious Accidents—What to Do and What Not to Do.
Dr. Chester S. Keefer, January 21, What About Sulfanilamide?
Dr. Perry C. Baird Jr., January 28, Care of the Complexion.
Dr. Paul D. White, February 4, Facts and Fancies About Heart Disease.
Dr. Grantley W. Taylor, February 11, Cancer.
Gerry B. Schnelle, February 18, The Medical Care of Domestic Pets.
Dr. Donald Macomber, February 25, Sterility (for women only).
Dr. Frank R. Ober, March 3, Backache.
Dr. William B. Breed, March 10, Health in Middle Age.

MICHIGAN

Honored at One Hundred.—Dr. John McLean, Hartford, was honored at a banquet November 14 by Masons of southwestern Michigan in observance of his one hundredth birthday. Dr. McLean graduated at Northwestern University Medical School, Chicago, in 1873 and was licensed to practice in Michigan in 1902.

Special Society Elections.—Dr. James A. Olson, medical director for the public schools of Flint, was elected president of the Michigan School Health Association at a recent meeting in Grand Rapids.——Dr. Mark F. Osterlin, medical superintendent of the Central Michigan Children's Clinic, Traverse City, was chosen president of the Michigan Pediatric and Infectious Disease Society at its annual meeting in Ann Arbor November 25; Dr. Campbell Harvey, Pontiac, was made vice president, and Dr. David M. Cowie, Ann Arbor, was reelected secretary.

Society News.—Dr. Henry Field Jr., Ann Arbor, discussed "Subclinical Pellagra in Michigan" before the Wayne County Medical Society, Detroit, December 11. A joint meeting with the Detroit Physiological Society was addressed December 18 by Clarence A. Mills, Ph.D., Cincinnati, on "Climatic and Weather Information on Health."——Dr. Raymond W. Waggoner, Ann Arbor, addressed the Genesee County Medical Society in Flint December 6 on "The Organic Background for Psychoses and Neuroses."——Dr. Orus R. Yoder, Ypsilanti, discussed "Psychologic Management of the Patient" before the Jackson County Medical Society November 21.——Dr. Evan V. Shute, London, Ont., discussed "Use of Endocrine Products in Gynecology and Obstetrics" before the Kalamazoo Academy of Medicine November 21.

MINNESOTA

Radiologic Meeting.—The Minnesota Radiological Society held its fall meeting at the Mayo Clinic, Rochester, December 2. Included on the program were the following:

Drs. Clarence A. Good Jr. and Arthur B. Hunt, Experiences with Roentgenologic Pelvimetry.
Dr. Harry M. Weber, The Proctosigmoiditis of Lymphogranuloma Venereum.
Drs. John A. L. McCullough and John D. Camp, Pseudo-Fractures in Diseases Affecting the Skeletal System.
Dr. Everett E. Seedorf, The Evaluation of Prostigmine, Barium Chloride, Oxygen and Pitressin for the Elimination of Flatus, in Roentgenograms of the Abdomen.
Dr. Stuart W. Harrington, Intrathoracic Tumors.

A symposium on primary carcinoma of the lung was presented by Drs. John W. Olds, Edgar H. Little and Eugene T. Leddy and in the evening at dinner Dr. Harry M. Worth discussed "Radiology in England" and Dr. Shao-hsun Wang, "The Practice of Medicine in China."

Society News.—At a meeting of the Minnesota Academy of Medicine in St. Paul November 8 Dr. Gilbert J. Thomas, Minneapolis, spoke on "Genital Tuberculosis."——Walter J. Meek, Ph.D., Madison, Wis., discussed "Effects of the General Anesthetics and Sympathomimetic Amines on Cardiac Automaticity" in a Mayo Foundation lecture in Rochester November 16.——The Hennepin County Medical Society devoted its meeting in Minneapolis November 29 to a symposium on headache; the speakers were Drs. Gordon R. Kamman, St. Paul; George E. McGeary, Lawrence R. Boies and Reuben A. Johnson. A symposium on joint injuries and their associated problems was presented before the society November 22 by Drs. Edward T. Evans, Miland E. Knapp and John H. Moe.——At a meeting of the Minnesota Pathological Society in Minneapolis December 19 the speakers were Drs. Charles E. Rea on "Present Day Concept of the Undescended Testis" and Nathaniel H. Lufkin, "The Myocardium in a Case of Myxedema."

NEW JERSEY

Health Association Meeting.—Dr. Leverett D. Bristol, Montclair, was elected president of the New Jersey Health and Sanitary Association at the annual meeting in Asbury Park November 17-18. Dr. Edward Guion, Northfield, was elected secretary.

Society Plans Exhibit for the Public.—The public relations committee of the Essex County Medical Society announces an "Exhibit for the Laity" to be held February 5-10, to acquaint the public with various phases of medical care and treatment. Thirty-three separate exhibits have been planned. Among them are fractures and industrial medicine, crime detection, cancer, pneumonia, venereal disease, hay fever, transfusions, necropsies, tuberculosis, a model operating room, eye conservation, medical history. The Essex County Dental Society and the New Jersey Pharmaceutical Association have been invited to present appropriate exhibits also. A program of evening lectures is being planned as part of the program.

Society News.—Dr. William Wolf, New York, addressed the Atlantic County Medical Society, Atlantic City, December 8 on "Procedures Common in Endocrinology."——Dr. Priscilla White, Boston, discussed diabetes in an address before the Camden County Medical Society, Camden, December 5.——Dr. Frank L. Meleney, New York, addressed the Academy of Medicine of Northern New Jersey, Newark, December 21 on septicemia.——Dr. Edwin H. Place, Boston, addressed the Hudson County Medical Society, Jersey City, December 5 on "Experiences in Diagnosis and Treatment of the Acute Infectious Diseases."——Dr. Manfred Kraemer, Newark, was elected president of the New Jersey Gastroenterological Society at the annual meeting December 4; Dr. Hyman I. Goldstein, Camden, vice president, and Dr. Sydney Rosenthal, Newark, secretary.——A program on pneumonia was presented before the Bergen County Medical Society, Hackensack, December 12 by Drs. Wheelan D. Sutliff, Norman H. Plummer and Charles Hendee Smith, all of New York.

NEW YORK

Society News.—Dr. George B. Eusterman, Rochester, Minn., addressed the Geneva Academy of Medicine at its annual dinner meeting November 16 on "Nonsurgical Aspects of Certain Acute Abdominal Conditions." Drs. William S. McCann, Rochester, and Samuel A. Munford, Clifton Springs, were guests who discussed the paper.——Dr. Ralph S. Bromer, Bryn Mawr, Pa., addressed the Schenectady County Medical Society, Schenectady, November 7 on "Roentgenologic Skeletal Changes in the Diseases of Infants and Children."——Dr. Henry C. Sweany, Chicago, addressed the Nassau County Medical Society, Garden City, November 28 on "What the Doctor Should Know About Tuberculosis."

Dr. Ross Honored.—The Suffolk County Medical Society gave a dinner November 25 at Smithtown honoring Dr. William H. Ross, Brentwood, in recognition of his fifty years of medical practice. Tributes were paid to Dr. Ross by Drs. Terry M. Townsend, New York, president of the Medical Society of the State of New York; Peter Irving, New York, secretary of the state society; Alec N. Thomson, Brooklyn, editor of the *Bulletin* of the Medical Society of the County of Kings; Frank Overton, Patchogue, editor of the *Journal of the Medical Society of New Jersey;* Arthur D. Jaques, Lynbrook, president of the Associated Physicians of Long Island, and Willetts W. Gardner, Patchogue, president of the Suffolk County society. Dr. Ross, who is 77 years old, has been president of the state medical society, the Associated Physicians of Long Island, the Suffolk County society and the New York Association of Superintendents and Managers of Tuberculosis Sanatoria, among other offices.

New York City

Investigation of Salmonella.—A center for the investigation of Salmonella has been established at Beth Israel Hospital, Stuyvesant Park East, under the direction of Dr. Friedrich Schiff of the department of bacteriology. The center is willing to investigate without charge doubtful cultures for Salmonella. The work is being done in cooperation with the International Salmonella Center in Copenhagen, Denmark.

Friday Afternoon Lectures at the Academy.—The Friday Afternoon Lectures at the New York Academy of Medicine during January and February will be as follows:

Dr. Yale Kneeland Jr., Primary Bronchopneumonia, January 5.
Dr. Donovan J. McCune, Recent Advances in the Clinical Use of Vitamin D and Related Compounds, January 12.
Dr. Martin Henry Dawson, Treatment of Chronic Arthritis, January 19.
Dr. James Burns Amberson Jr., Choice of Treatment for Pulmonary Tuberculosis with Special Reference to Newer Surgical Procedure, January 26.
Dr. Carl H. Smith, Management of the Anemias in Infancy and Childhood, February 2.
Dr. George Gray Ward, Recent Advances in Gynecology, February 9.
Dr. George M. MacKee, Recent Advances in Dermatology, February 16.

New Directors of Hospital Service Plan.—Seven new directors have been added to the board of Associated Hospital Service of New York, five representing the medical profession and two the administrators of hospitals. The physicians, appointed from a list submitted by the county medical societies in the metropolitan area, are Drs. John J. Masterson, Brooklyn; Milton J. Goodfriend, Charles Gordon Heyd, New York; Joseph Wrana, Jamaica, and Eric H. G. Restin, Mount Vernon. The hospital administrators are Drs. Joe R. Clemmons, New York, and George O'Hanlon, Jersey City, N. J.

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Society News.—Speakers at a stated meeting of the New York Academy of Medicine December 7 on disorders of the venous and lymphatic systems were Drs. Cecil K. Drinker, Boston, on "Participation of the Lymphatics in Acute and Chronic Inflammations"; Bayard T. Horton, Rochester, Minn., "Clinical Aspects with Respect to the Venous System," and Gerald H. Pratt, "Surgical Considerations."——Speakers before the New York Roentgen Society December 18 included Drs. Samuel J. Goldfarb, Burrill B. Crohn, David Adlersberg and Marcy Lee Sussman, who presented a symposium on the small intestine. ——Dr. Sara M. Jordan, Boston, gave a Friday afternoon lecture before the Medical Society of the County of Queens November 17 on medical aspects of gastric disease.——Dr. William S. Collens gave a Friday afternoon lecture of the Medical Society of the County of Queens December 15 on "Organic Peripheral Vascular Disease."——The New York Academy of Medicine announces that dates for the Thirteenth Graduate Fortnight will be Oct. 14-25, 1940.

Hospital Celebrates Seventy-Fifth Anniversary.—The Hospital for Ruptured and Crippled marked its seventy-fifth anniversary with a dinner November 2 at the University Club. Speakers who discussed various phases of the hospital's work and history were:

Dr. Fenwick Beekman, attending surgeon at the hospital.

Dr. George E. Bennett, associate professor of orthopedic surgery, Johns Hopkins University School of Medicine, Baltimore.

Dr. William E. Gallie, dean, University of Toronto Faculty of Medicine, Toronto, Ont.

Dr. Robert B. Osgood, professor emeritus of orthopedic surgery, Harvard Medical School, Boston.

Dr. Eugene H. Pool, clinical professor of surgery, Cornell University Medical College and Columbia University College of Physicians and Surgeons.

Dr. Paul C. Colonna, professor of orthopedic surgery, University of Oklahoma School of Medicine, Oklahoma City.

Dr. Philip D. Wilson, clinical professor of orthopedic surgery at Columbia and surgeon in chief at the hospital.

To mark the anniversary Dr. Beekman has written a 157 page history of the hospital, which has grown from an institution accommodating twenty-eight persons to its present capacity of 250 beds.

New Dean at New York Medical College.—Other Faculty Changes.—Dr. Ferdinand C. Lee, associate professor of surgery, Johns Hopkins University School of Medicine, Baltimore, has been appointed dean of New York Medical College, Flower and Fifth Avenue Hospitals. Dr. Lee will also be professor and head of the department of surgery. He succeeds as dean Dr. Claude A. Burrett, who has been made president of the college and hospitals. Dr. J. A. Werner Hetrick has been appointed associate dean and Mr. David Q. Hammond, director of the hospitals. Other appointments to the faculty include:

Dr. Thomas I. Hoen, recently head of the department of neurosurgery and neurology at St. Luke's and St. Mary's hospitals in Montreal, Canada, professor of neurosurgery and head of the department of neurosurgery and neuropsychiatry.

Dr. Richard Townley Paton, recently surgeon on the staff of the Manhattan Eye, Ear and Throat Hospital, professor and head of the department of ophthalmology.

Dr. William H. Everts, who took the degree of doctor of medical sciences at Columbia University College of Physicians and Surgeons in 1936 and received later training in the New York Neurological Institute, professor of neurology.

NORTH CAROLINA

Hospital News.—The cornerstone of a new building for the Presbyterian Hospital, Charlotte, was laid November 15. The Duke Endowment contributed $150,000 toward the new building. The present hospital will be remodeled for a nurses' home.

Society News.—Dr. Franklin Webb Griffith, Asheville, addressed the Buncombe County Medical Society, Asheville, December 4 on "Urgent Surgery on Infants."——Speakers at a meeting of the Catawba Valley Medical Society, Lenoir, November 14, were Drs. Ernest Washington Franklin Jr., Charlotte, on "Traumatic Postpartum Hemorrhage"; Frederick Mast Dula, Lenoir, "Diagnosis of Appendicitis," and Yates Shuford Palmer, Valdese, "Treatment of Lower Extremity Varicose Veins by Ligation and Injection."

PENNSYLVANIA

Society News.—Dr. Frederick M. Jacob, Pittsburgh, addressed the Westmoreland County Medical Society December 19 at the Mountain View Hotel near Greensburg on "Inflammatory Diseases of the Skin—Eczema, Psoriasis, Hives (Erythemas)."——Drs. Edward F. Hartung, New York, and Francis C. Grant, Philadelphia, were guest speakers at the semiannual clinic meeting of the Lycoming County Medical Society, Williamsport, November 10, on "Rheumatoid Arthritis" and "Diagnosis and Treatment of Cerebral Lesions" respectively.

WEST VIRGINIA

Council Approves Platform.—The council of the West Virginia Medical Association at a meeting in Charleston December 14 adopted a resolution approving the recommendation of the American Medical Association for a federal department of health with a physician as head. The resolution also expressed approval of the entire platform recently set forth by the Board of Trustees of the Association.

GENERAL

Sectional Meeting on Ear, Nose and Throat.—The Eastern section of the American Laryngological, Rhinological and Otological Society will hold its annual meeting in Pittsburgh January 5. The speakers will include Drs. Francis W. Davison, Danville, Pa., on "Acute Laryngotracheobronchitis"; Carl H. McCaskey, Indianapolis, "Etiology and Treatment of Seventh Nerve Paralysis"; James G. Dwyer, New York, "Present Status of Otitic Meningitis," and Fred W. Dixon, Cleveland, "Practical Points in the Treatment of Sphenoiditis."

Changes in Status of Licensure.—The Indiana State Board of Medical Registration and Examination reports the following:

Dr. Joseph Edward Sharp, Indianapolis, license revoked November 16.

Dr. Harry C. Judkins, Stockwell, license revoked November 16 because of admitted drug addiction to the extent of rendering him unfit for practice.

Dr. Scott R. Edwards, New York, license revoked November 16 because of admitted drug addiction to the extent of rendering him unfit for practice.

The Kansas Board of Medical Registration and Examination announces the following:

Dr. John R. Clark, Independence, license revoked June 13 for gross immorality, having been convicted of a felony.

Dr. Charles C. Keester, Wichita, license restored June 27.

The Massachusetts Board of Registration in Medicine reported the following:

Dr. David H. Shulman, Brookline, license restored August 18.

The Washington state department of licenses reports the following action:

Dr. Edna V. Dale, whose last known address was Yakima, license revoked recently for violation of the narcotic laws.

Progress of Venereal Disease Control.—Every state and territorial health department in the United States had a separate division or subdivision for control of venereal diseases by the end of the fiscal year 1939, the U. S. Public Health Service reports. In 1938 twenty-seven states were so organized. About 103,000 persons were discharged from clinics as cured or with syphilis arrested in 1939 as compared with 78,000 in 1938, the report continued. Persons brought under treatment for the first time numbered 315,000 and the number of treatments administered was 8,000,000. Nineteen states now require examinations including blood tests for syphilis of all applicants for marriage licenses and fifteen require physicians to perform blood tests for syphilis on expectant mothers. In 1939 2,405 venereal disease clinics reported to the public health service, an increase of 37.7 per cent over 1938. Research activities were continued, many of them in cooperation with various medical groups and with state and local health departments. Training centers in venereal disease control have been established for physicians and nurses in nine universities. The service allotted $2,400,000 of its $3,000,000 appropriation for 1938-1939 to state health departments, and the funds were supplemented by $4,300,000 in state and local funds.

Government Services

Health in the Civilian Conservation Corps

The death rate in the Civilian Conservation Corps for the fiscal year ended June 30, 1939, was 2.02 per thousand as compared with 2.38 for the previous year. A great reduction in the case fatality rate in pneumonia was reported: 4.1 as compared with an average rate for the preceding five years of 12.6. The rate of incidence of pneumonia was also much lower than in any year of the corps' existence except 1934. Tuberculosis caused a slightly lower death rate in 1938, 5.3 as compared with 6 per hundred thousand the previous year. There were nine cases of typhoid with no deaths, a rate of 3.4 cases per hundred thousand enrollees. In 1935 the rate was 25.9 and the next year it dropped to 7.8, a reduction attributed to improvement in water supplies and methods of handling waste and to the greater protective value of a new vaccine introduced in 1936. The most frequent communicable diseases in the corps were influenza and other respiratory diseases.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 25, 1939.

Reorganization of Scheme for Treatment of Air Raid Casualties

When the present scheme for the treatment of casualties from air raids was prepared it was assumed that a large number might have to be dealt with quickly, and 200,000 hospital beds were made available within twenty-four hours. London had to be taken as a target area and, as far as possible, hospital patients in it were removed to safer areas. So far no air raids on any scale have occurred. There has been an opportunity to reorganize the scheme. Some 700 specialists left their private practice and work in the London hospitals for full time posts in the emergency medical service and went to staff the outlying hospitals. The salaries paid by the government involved hardship for senior men with heavy financial responsibilities. Recommendations were made by the Central Medical War Committee and accepted. The result is that only a nucleus of the medical staff will be employed full time. A large proportion of the specialist work will be done by part time officers, who will be free to engage in private practice but will undertake in consideration of the payment of $2,500 a year to come up for service when required. They will give, without additional remuneration, whatever services the number of casualties may from time to time require of them. Thus most of the specialists will be able to return to their private work and their hospitals. The remainder of the service will be composed of another grade of part time officer, who will come up for duty when called on.

In the provinces there are many hospitals to which no whole time officer of the emergency medical service will be attached. The responsibility for treating air raid casualties will fall on the medical staff, who normally give their services free in these hospitals. Under another recommendation of the war committee which the government has accepted, they will be remunerated out of a pool provided by the payment to the hospital of 36 cents a day for each bed occupied. If the patient is treated in the outpatient department the physician will be remunerated out of a pool provided by the payment of 12 cents for each outpatient attendance. The casualties for whose treatment the government is accepting financial responsibility include not only civilians injured in air raids but also the injured taken from ships, the sick and casualties from the fighting forces and unaccompanied evacuated children.

The staffing arrangements of first aid posts have also been revised. The original arrangement provided for a medical officer and a trained nurse in attendance at each post. In the 1,150 posts in the more vulnerable areas the medical officer in charge will be paid a fee of $375 a year, the employment to be for six months in the first instance. He will also receive $7.50 for a session of not more than two hours and $16 for a longer session whenever he attends at the post to deal with casualties.

Twenty-eight casualty evacuation trains have been equipped, but ten of these have been transferred to the war office for the use of the fighting services. For interhospital ambulance work 350 coaches, normally used for passenger traffic, have been converted into ambulances, but the situation is now such that 153 of them will be released.

The Army Blood Transfusion Service

With the help of the Royal College of Surgeons, the army medical service evolved an organization before the war to supply an army in the field with sufficient stored blood. When war broke out this skeleton organization was expanded to form the army blood transfusion service, which consists of a home unit responsible for the supply of stored blood and an oversea unit responsible for its distribution. The home unit is enrolling volunteer blood donors who will give at stated intervals quantities of their blood, which is bottled and conveyed by airplane oversea. Distribution to forward units is then carried out by mobile refrigerator vans. The army blood transfusion service is responsible, either directly or indirectly, for the blood transfusion arrangements for all the fighting forces. As our military effort increases, the amount of blood required will increase. Therefore the roll of blood donors must be augmented. Within the next year the army aims at a roll of 250,000 volunteers, both men and women. They all know that the giving of blood will not impair their working efficiency, even for a short time. Blood transfusion has been performed in various recent campaigns, but no parallel exists in the world for an organization such as now exists in the British army.

Fatal Confusion of Procaine with Percaine

A physician desiring to administer a local anesthetic to a patient suffering from arthritis went to a pharmacist's shop and asked for a 2 per cent solution of procaine. He later received a bottle labeled "Not to be taken; sterile solution of percaine 2 per cent, 50 cc., Poison." He read the label and referred to the manufacturer's catalogue, where he found listed a 2 per cent solution of percaine for use "exclusively in surface anesthesia." He decided that it would serve his purpose and injected about 12 cc. around the patient's shoulder. Within five minutes she said that she felt faint. She then went into convulsions and died after about half an hour from heart failure and acute edema of the lungs.

At the inquest the physician stated that he thought that the use for surface anesthesia did not exclude subcutaneous injection. When he went to the pharmacist he did not know that there was such a preparation as 2 per cent percaine, though he had heard the name. He knew that procaine was a normal local anesthetic and that percaine was more commonly used as a spinal anesthetic and that if he had asked for percaine he would have had to sign the poison book. In cross examination he admitted that he did know that percaine was ten times as poisonous as procaine. In his evidence the dispenser of the bottle stated that the physician asked for percaine. A medical representative of the manufacturers said that percaine was a synthetic local anesthetic with properties like those of cocaine and might be injected into the tissues, but 2 per cent solution was not safe. The proper strength in this case would have been 0.1 per cent, while 2 per cent of procaine would have been suitable. A pathologist gave evidence that percaine was a proper drug to administer in this case but that the strength was too great. The coroner said that it was dangerous to give a verbal order for a drug and that when the physician found that percaine was sent he could have rung up the pharmacist. The jury returned a verdict of death from misadventure with negligence on the part of the physician and pharmacist, but not criminal negligence.

The Treatment of Tuberculosis in Wartime

In previous letters the taking over of hospitals and other institutions and adapting them to the accommodation of the large number of war casualties, military and civilian, which were expected has been reported. This of course has given rise to difficulties in the treatment of the sick. Tuberculosis is a case in point. The minister of health outlined to a deputation representing the National Association for the Prevention of Tuberculosis, the Joint Tuberculosis Council and the Tuberculosis Association the steps taken to ensure that tuberculous persons continue to receive treatment while an adequate reserve of beds is kept for air raid casualties. Although some patients had been discharged from sanatoriums and other insti-

tutions to provide accommodations for casualties, about two thirds of the 28,000 beds for the treatment of tuberculosis in England and Wales remained available for their peace time purpose. If by mistake some actively infectious persons had been discharged, they would be sought out and brought back for treatment. As more and more of the hutted annexes to hospitals were completed, so more and more beds at present allotted to casualties would be released. After an initial lull the dispensary services were returning to normal, and difficulties caused by a temporary transfer of personnel were being overcome. The importance of maintaining facilities for the surgical treatment of tuberculosis, both pulmonary and nonpulmonary, was fully recognized. The minister was also fully alive to the need for arrangements for the treatment of tuberculous patients in the army, navy and air force.

BERLIN

(From Our Regular Correspondent)

Nov. 11, 1939.

Curtailed Use of Boron Derivatives

The use of boron derivatives for chemical purposes has recently been curtailed. An official opinion of the state health department has been published bearing on the more economical use in medicine of these derivatives. An order prohibiting general advertising of such treatments will be soon released. Borates are more widely used as mild disinfectants and to check inflammations; according to extensive clinical experiences, very small quantities are sufficient for this purpose. In otorhinolaryngology the use of finely powdered boric acid in insufflations, as well as 2 per cent of boric acid solution, cannot be dispensed with. In pyocyaneus suppuration and perichondritis, boric acid must be regarded as a superior medicament. Boron derivatives used for the eye are among the few remedies that never provoke hypersensitiveness. A boric acid ointment of 3 per cent constitutes a nonirritant, indifferent salve. (The ointment sold by druggists, according to the German pharmacopeia, contains 10 per cent.) Many surgeons and gynecologists do not like to dispense with boric acid solution for cleansing the urinary passages, while internists attach less importance to it. In obstetric practice a 3 per cent solution of boric acid is applied to the eyes of newborn infants and used for cleansing the mother's nipples after nursing. However, boiled water is said to be satisfactory. Its use varies in different gynecologic clinics, but here too substitutes for borates can perhaps be used, especially for the ointment, which is much in use. Borates have relatively little significance in internal medicine and pediatrics. Accordingly, boric acids and borates are indispensable only in relatively few therapeutic fields. Many economies can therefore be made.

Commercial Use of Mother's Milk

For years, efforts have been made to promote the availability of excess mother's milk. Regulations for the organization of collecting stations have recently been announced. Thirteen of these stations are already functioning in Germany. Large cities seem best adapted as collecting centers because of the demand as well as the possibility of securing donors for this service in connection with an existing institution, so that a daily regular supervision can be assured. Besides dealing with numerous administrative measures, the regulations deal with measures necessary to conserve the biologic value of mother's milk. Women who wish to donate their surplus milk are examined in advance for their health and the condition of nutrition. Likewise the milk itself and the health of the nurslings are regularly examined about once in four weeks. The price paid at present for mother's milk per liter (quart) amounts to from 2 to 2.50 marks (from 80 cents to a dollar). The milk when delivered at the station is at once subjected to a cooling process and examined in accordance with precise directions, bacteriologically and chemically. If it passes the test, it is sterilized five minutes at 212 F. It is then placed at once into refrigeration and must be kept there for five hours before it can be used. Mother's milk is furnished to clinics and otherwise only on medical certification, which must state the reasons for its need. Babies after recovery of their health should not be supplied with this milk, because it is difficult of procurement. For that reason the medical prescription is valid only for two to three weeks. The selling price to private persons is at present from 5 to 6 marks (from $2 to $2.40) per liter.

State Commission on Cancer Control

The papers read at the scientific meeting of the state commission on cancer control were chiefly by the Austrian members of the commission. Christiani, of Vienna, discussed the relation of enzymes to cancer. He discovered that the substance in the normal serum that acts as a catalyzer on carcinomatous cells is an enzyme localized in the albuminous fraction. For this reason the assumption seems justified that the carrier of this enzyme is an albumin. Three criteria favor the enzymic nature: its thermolability, its insolubility in esters and the dependence of its effect on the hydrogen ion concentration. This substance is effective only in the hydrogen ion concentration that corresponds to the native serum. It is important that this enzyme be lacking in the carcinomatous serum. The enzymes that promote oxidation and are so necessary for the formation of a deactivation in the organism of the cancerous patient are disturbed, the ergosterol cannot undergo oxidation change and, in consequence, a deactivator is not formed. It is only through radium or roentgen irradiation that the deactivating agent can be formed in the organism of cancerous subjects. According to the speakers, direct oxidation of ergosterol by means of irradiation is involved. Three enzymes, or enzymic systems, accordingly have suffered a disturbance; the enzyme that catalyzes the carcinomatous cells, the enzymes that promote the oxidation needed to form the deactivating agent and certain dehydrases of a specific dehydrating enzymic system. This enzymic system has the function of modifying through dehydration the butyric acid that forms so that the pathologic butyric acid cholesterol ester cannot come into existence. On the question of cancer heredity Denk, of Vienna, reported that, in accordance with the data gathered by the Austrian Cancer Society, in 20 per cent of the 8,475 cases a familial connection could be proved, results which are in accord with the literature. Leb, of Graz, discussed the radiologic treatment of advanced carcinomas. In cases that seemed therapeutically hopeless, notable palliative results were achieved. Even in cases of multiple skeletal metastasis, though death could not be prevented, nevertheless in fifty-eight cases of inoperable carcinoma an improvement of the anatomic and the general condition was obtained by means of irradiation in 76 per cent. In carcinomas of the esophagus, after endo-esophageal radium and roentgen treatments the ability to swallow was improved in 62 per cent. According to Marschik, of Vienna, irradiation and surgery ought to be combined in carcinomas of the larynx. Tumors ensuing from the base of the tongue seem, he said, to cause regional metastasis sooner than those proceeding from the epiglottis. Through surgical removal of a glandular metastasis before irradiation even better results seem to be obtained. The combination of irradiation and surgery yields better and more permanent results than surgery alone. Early diagnosis is of great importance. Hofbauer, of Vienna, discussed the demarcation of surgical and radiologic indication on the basis of data of the Eiselsberg Clinic, the radiologic institute of Vienna, the radium institutes of Paris and of Stockholm and that of the literature. Carcinomas of the cheek, tongue, oral cavity, tonsils, gums and penis are to be irradiated, especially with radium; the intraperitoneal tumors are to be operated on as in the past; other types, as carcinoma of the breast, are to be operated on and subsequently irradiated. Kögl, of Utrecht, proceeding from

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chemical investigations, discussed the etiology of tumors. His exceptionally careful analyses disclosed basic chemical differences between normal, benign and malignant tissues. Carcinomatous cells have lost the ability possessed by normal cells to incorporate into their structural albumin exclusively the "normal amino acids." Hueck, of Leipzig, supported by Rajewski, of Frankfort on the Main, reported his results of pulmonary carcinomas found among the Schneeberg miners. This form of carcinoma has been legally recognized as an occupational disease. It is now assumed that the high radon content in the stone dust is the cause of this type of cancer. Mice suspended in cages in certain parts of the mines developed tumors, including malignant pulmonary tumors, quite abundantly.

STOCKHOLM

(From a Special Correspondent)

Dec. 3, 1939.

Red Cross Air Ambulance Services

Surgeon General, retired, Fritz Bauer, who has for years taken an active part in the Swedish Red Cross Society, published in a recent issue of the journal of this society an account of what it has done to promote air ambulance services since 1924, when they were first started. His is a story of pioneer work, of the expenditure of vast sums on what at times must have seemed a forlorn hope, and of disasters which have cost seven lives. The nature of air ambulance service makes this particular branch of aeronautics exceptionally dangerous; the urgent case requiring immediate operation or other treatment cannot wait till atmospheric conditions improve. In spite of often unfavorable weather, the appeals for the aid of the air ambulance service were answered in 544 of 582 cases.

Bringing his statistical information up to the end of May 1939, Surgeon General Bauer shows that, since 1924, Red Cross air ambulance services have transported 1,431 patients and have covered 402,151 kilometers. The number of patients carried may be raised to 1,543 by the inclusion of those transported by private and other airplanes. There were 218 cases of infectious disease, 480 cases of acute gastrointestinal disease, ninety-two cases of acute pneumonia, 160 cases of difficult labor or abortion and 322 accident cases transported. The fifteen cases of acute mental disease must have been the most difficult to deal with in the air. It is in the spring and autumn, when the ice is melting or beginning to form, that the difficulties are greatest in Sweden; and, when preference is shown for comparatively light machines, this is largely in deference to the thinness of the ice on which a plane may have to alight during two or three out of the twelve months in the year. Unless ice is some 20 cm. thick, a heavy airplane is apt to crash through it. The comparatively high cost of the heavier airplanes is also an important factor militating against their general use for ambulance work.

The Treatment of Dipsomaniacs

Heretofore it has been almost universally assumed that alcoholic addicts are degenerate or psychopathic individuals who are candidates for mental hospitals or special institutions. To admit such cases to a general hospital has seemed the more undesirable as they often require isolation and other special measures for which provision is made only in mental hospitals. The frequent association of alcoholism with crime has been another reason why those in charge of general hospitals have been shy of opening their doors to cases of alcoholism, acute or chronic.

The soundness of this attitude has been challenged by certain Swedish doctors, prominent among whom is Dr. J. Tillgren of the Maria Hospital, where for years the practice has been adopted of admitting cases of alcoholism on the assumption that they are just as much in need of the skilled supervision and treatment available in a general hospital as any other case. At the Maria Hospital it is customary for acute cases of alcoholism to be discharged after about three weeks—a period so short that the patient does not miss that occupational treatment which is available in certain institutions for chronic cases.

This movement away from special homes for alcoholic addicts to general hospitals has been favored by certain shortcomings in the former. There are several such homes in Sweden with a total of about 800 beds, but in some of them there is no resident medical officer, and the visiting medical officer puts in an appearance only once or twice a month.

The Late Prof. Carl Gustaf Santesson

Professor Santesson died of coronary thrombosis July 26. His father was a Swedish professor of surgery and his mother was a sister of a Swedish professor of anatomy. Studying in Uppsala and Stockholm, Santesson in 1891 successfully defended his thesis for the degree of M.D. But at this stage in his career pharmacology enjoyed a renaissance which inspired him and made him its servant for the rest of his life. Returning from prolonged studies in Germany, Santesson taught pharmacology in Uppsala and in 1895 was appointed professor of pharmacodynamics and pharmacognosis at the Caroline Institute in Stockholm. As a research worker and as an author, Santesson was indefatigable; his publications number over 200. He was particularly interested in the action of poisons employed by primitive peoples on their arrows, and on this subject alone he published a score of studies. His modesty and kindliness endeared him to many generations of medical students.

AUSTRALIA

(From Our Regular Correspondent)

Nov. 21, 1939.

Protection of Professional Incomes During Military Service

Practitioners entering military service in Australia must suffer a reduction in their income. A modern fighting force cannot function without medical services and it is necessary also to have a proportion of experienced medical officers as well as those who have recently graduated. As the majority of these men will hold the rank of captain, at approximately £400 per annum, and experience indicates that the income of a practice rapidly diminishes in the absence of the principal, these men will be called on to make a sacrifice out of all proportion to that imposed on those who do not join the services. The council of the Victorian branch of the British Medical Association, therefore, has devised a scheme for the protection of professional incomes during military service. It provides for the establishment of an income insurance fund by means of which losses may be spread more evenly on the whole of the profession. Men who remain in civil and departmental practice and practitioners on military duty who suffer no loss of income are invited to contribute to this fund, which will be applied to rendering financial assistance to men on active service who do suffer loss of income. The proposed contributions have been equitably arranged on a percentage basis of gross professional income earned, graduated to spread the burden in accordance with ability to pay. These contributions might be regarded as premiums for insurance against a risk —loss of professional income—which it is impossible for any practitioner at this stage to know that he will not himself be called on to suffer. Membership in the fund is voluntary. Financial assistance for a member shall not exceed £500 per annum, and in no case will it be greater than an amount, with the member's military pay, to provide him with an income of more than £900 per annum.

A second part of the scheme provides for the organization of groups of members of the profession for the purpose of carrying on the practices of members of the group who may

be called up for military duty. The experience of the last war has not been forgotten, when, all too commonly, those who kept the home fires burning took the opportunity to warm themselves by the fire. This second portion of the scheme provides also that no practitioner shall commence practice in a group area without purchase for the duration of the war and six months after, that all practitioners refuse to attend for at least twelve months the patients of another practitioner who has resumed practice after military service, that all appointments held on behalf of the absentee be returned and that all appointments made during the war be only temporary and be thrown open for application at the termination of the war.

By offering their full support of these recommendations, members of the British Medical Association in Victoria will fulfil one of its first objects: "the maintenance of the honor and interests of the profession."

The Walter and Eliza Hall Institute of Research

A great deal of the original research which is making Australian workers known overseas has come from the Walter and Eliza Hall Institute of Research in Pathology and Medicine, which has published its twentieth annual report. The trustees of the late Walter and Eliza Hall completed the pathologic block of the Royal Melbourne Hospital and provided a sum of £2,500 annually toward the upkeep of the institute. Since 1930 this sum has been £3,200 a year. The work of the institute is undertaken under conditions which are at once an advantage and a disadvantage. The routine services of the Royal Melbourne Hospital in bacteriology and pathology are carried out at the institute, and work of this kind must be a distraction to the director and certain of his co-workers, but it does bring the hospital, as it were, into the institute, and this close association cannot fail to be a stimulus to the members of the honorary staff. Pride of place is given in the report to the work of Dr. F. M. Burnet and other members of the virus department. This department has been financed by annual grants of £1,000 from the Rockefeller Foundation and of the same amount from the commonwealth department of health. Among the conditions investigated during the past twelve months have been poliomyelitis, herpes, influenza, Q fever, psittacosis and myxomatosis. In the department of physiology work has been done by Dr. W. Feldberg, Dr. E. R. Trethewie and the director (Dr. C. H. Kellaway) on tissue injury by snake venom, staphylococcus toxin, mercury bichloride, radiant energy, anesthetics and anaphylaxis. In all, thirty important papers have been published, and it need hardly be stated that the published papers do not represent all the work that has been proceeding at the institute. The financial statement shows that this work has all been carried out for the modest sum of £5,399.

Marriages

Angus Morris McDonald Jr., Charlotte, N. C., to Miss Mary Letty Mebane, of Greensboro, in October.

John Austin Ryan, Milan, Mich., to Miss Alma Lloyd Ranson, at Durham, N. C., November 4.

J. Thomas Millington Jr., Wilkes-Barre, Pa., to Roberta Walton, of Kingston, October 15.

John N. McCann to Miss Mary Louise Radowick, both of Youngstown, Ohio, October 16.

Paul Russell Griffith to Miss Ida Louise McCoy, both of Berwyn, Ill., November 4.

Samuel Kenneth Gerson, Cleveland, to Miss Jean Long, at Canton, Ohio, October 25.

Vincent J. Gaul, Chicago, to Miss Ruth Wigent, of Fort Wayne, Ind., in October.

Deaths

Amédée Granger ● New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1901; professor of radiology, Louisiana State University Medical Center; professor of radiology at the Tulane University Graduate School of Medicine, 1916-1931; chief of service of radiology, Charity Hospital, 1905-1921, and director of the department since 1921; veteran of the Spanish-American War; member and vice president in 1929 of the Radiological Society of North America; member of the American College of Radiology and chancellor, 1923-1926; member of the French-Speaking Doctors of North America and in 1934 vice president; past president of the Louisiana State Society of Radiology and the Orleans Parish Medical Society; member of the American Roentgen Ray Society; was decorated by the French, Belgian and Italian governments for his work on x-ray; in 1926 was awarded the gold medal of the Radiological Society of North America; author of "Radiologic Atlas of the Pathological Changes of Bones and Joints" published in 1911; aged 60; died, December 15.

William H. Washburn, Milwaukee; Rush Medical College, Chicago, 1877; member of the State Medical Society of Wisconsin; secretary of the Section on Practice of Medicine of the American Medical Association in 1894; past president of the Medical Society of Milwaukee County and the Milwaukee Academy of Medicine; professor of medicine emeritus at Marquette University School of Medicine; served at various times and in various capacities on the staffs of the Johnston Emergency Hospital, St. Joseph's Hospital, County Hospital and Milwaukee General Hospital; member of the medical advisory board during the World War; aged 85; died, October 4, of myocarditis.

Thomas John Scanlan ● Boston; Tufts College Medical School, Boston, 1903; member of the New England Obstetrical and Gynecological Society; served during the World War; chairman of the board of trustees of the Boston State Hospital; served in various capacities and at various times on the staffs of the Foxboro (Mass.) State Hospital, Boston Dispensary, Deer Island Hospital, St. Elizabeth's Hospital and the Winthrop (Mass.) Community Hospital; aged 67; died, October 18, at his home in West Roxbury.

Joseph Lee Kirby-Smith ● Jacksonville, Fla.; University of the South Medical Department, Sewanee, Tenn., 1906; first lieutenant and acting assistant surgeon in the U. S. Public Health Service during the World War; on the staffs of St. Luke's Hospital, St. Vincent's Hospital and Duval County Hospital, Jacksonville, and the Flagler Hospital, St. Augustine; past president of the Florida Society of Dermatology and Syphilology; aged 57; died, November 5.

George Edward Decker ● Davenport, Iowa; State University of Iowa College of Medicine, Iowa City, 1897; fellow of the American College of Surgeons; at one time president and medical director of the Register Life Insurance Company; at one time member of the state boards of health and medical examiners; formerly member of the school board; formerly on the staff of St. Luke's Hospital; aged 66; died, November 3, in the Holmes Hospital, Cincinnati.

Edward M. D. Libby ● Iron River, Mich.; Rush Medical College, Chicago, 1898; fellow of the American College of Surgeons; past president of the Upper Peninsula Medical Society and the Dickinson-Iron Counties Medical Society; member of the school board for many years; aged 62; died, November 10, in the Iron Mountain (Mich.) General Hospital of injuries received in an automobile accident.

Louis Schneider Weaver ● York, Pa.; Johns Hopkins University School of Medicine, Baltimore, 1904; member of the American Roentgen Ray Society; fellow of the American College of Surgeons; veteran of the Spanish-American and World wars; trustee of the Gettysburg (Pa.) College; surgeon to the York Hospital; aged 62; died, October 1.

William Richardson Culbertson, Coeburn, Va.; Baltimore University School of Medicine, 1904; served during the World War; formerly health officer of Wise County; part owner of the Coeburn Hospital; aged 60; died, November 6, at the New Altamont Hospital, Christiansburg, of pneumonia as the result of injuries received in an automobile accident.

Frances Culbreth Van Gasken, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1890; member of the Medical Society of the State of Pennsylvania; formerly

professor of clinical medicine at her alma mater; on the consulting staff of the Woman's Hospital; aged 79; died, October 24, at Drexel Hill.

Roscoe Addison Mitchell, Marshall, Ill.; State College of Physicians and Surgeons, Indianapolis, 1907; member of the Illinois State Medical Society; for many years bank president; served during the World War; aged 60; died, November 12, at the Paris (Ill.) Hospital as the result of a cerebral hemorrhage.

Corbett Edward Tumlin ● Miami, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1915; member and past president of the state board of medical examiners; on the staffs of the Jackson Memorial Hospital, Riverside Hospital and Victoria Hospital; aged 46; died, November 6.

Joseph Peter Weyrens, Scottsbluff, Neb.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1907; member of the Nebraska State Medical Association; formerly county physician and chairman of the county medical advisory board; aged 62; died, October 7, of leukemia.

William Boswell Small, Waterloo, Iowa; Chicago Medical College, 1890; member and past president of the Iowa State Medical Society; fellow of the American College of Surgeons; member of the House of Delegates of the American Medical Association 1917-1920; aged 77; died, October 9.

Charles Edward O'Connor, Kingston, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1898; associate professor of ophthalmology and otolaryngology at his alma mater; on the staff of the Hotel Dieu Hospital; aged 65; died, November 7, in St. Michael's Hospital.

Clarence Eugene De Groot, Muskogee, Okla.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1904; member of the Oklahoma State Medical Association; past president of the Muskogee County Medical Society; federal jail physician; aged 60; died, October 26.

Nicholas Thomas Grace, Brooklyn; Long Island College Hospital, Brooklyn, 1931; member of the Medical Society of the State of New York; on the staffs of St. Mary's Hospital, Brooklyn Hospital and the Long Island College Hospital; aged 33; died, November 9.

Ernest M. Haggard, Indianapolis; Physio-Medical College of Indiana, Indianapolis, 1894; on the consulting staff of the City Hospital; on the visiting staff of the Methodist, St. Francis and St. Vincent's hospitals; aged 77; died, November 7, of cerebral hemorrhage.

Lewis Nostrand Anderson, Brooklyn; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1895; member of the Medical Society of the State of New York; on the staff of St. John's Hospital; aged 67; died, November 10.

Clarence Dale Fulkerson, French Lick, Ind.; Medical College of Indiana, Indianapolis, 1898; member of the Indiana State Medical Association; served during the World War; aged 68; died, November 4, in the Veterans Administration Facility, Hines, Ill.

Richard H. Simpson, Dallas, Texas; Arkansas Industrial University Medical Department, Little Rock, 1887; Kentucky School of Medicine, Louisville, 1899; member of the State Medical Association of Texas; aged 77; died, October 29, of chronic nephritis.

Burt Edward Scott, Berlin, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1901; member of the State Medical Society of Wisconsin; served during the World War; on the staff of the Berlin Memorial Hospital; aged 67; died, October 2.

Charles Rohrer Kiser ● Madison, Ill.; Medical College of Ohio, Cincinnati, 1895; past president of the Madison County Medical Society; aged 72; died, November 5, in a hospital at Hamilton, Ont., of a skull fracture received in an automobile accident.

Theodore Miller ● Cleveland; Harvard Medical School, Boston, 1908; member of the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; on the staff of St. Luke's Hospital; aged 55; died, November 7.

David Leonard Hedberg, Evanston, Ill.; Northwestern University Medical School, Chicago, 1909; served during the World War; at one time police surgeon; aged 61; died, November 19, in the Veterans Administration Facility, Dearborn.

Wiley S. May, Little Rock, Ark.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1893; College of Physicians and Surgeons, Little Rock, 1908; Kansas City (Mo.) College of Medicine and Surgery, 1920; aged 68; died, November 3.

Christopher C. Threlkel, Morgantown, Ky.; University of Tennessee Medical Department, Nashville, 1898; member of the Kentucky State Medical Association; for many years county health officer; aged 66; died, November 9.

Francis Owington Rogers, Little Rock, Ark.; University of Maryland School of Medicine, Baltimore, 1901; member of the Arkansas Medical Society; aged 63; died, November 8, in the Lynnhurst Sanitarium, Oakville, Tenn.

Herbert Elmer Stevenson, El Paso, Texas; Rush Medical College, Chicago, 1899; member of the State Medical Association of Texas; veteran of the Spanish-American and World wars; aged 68; died, November 2.

Joseph James McNamara, Rochester, N. Y.; Fordham University School of Medicine, New York, 1917; member of the Medical Society of the State of New York; aged 47; hanged himself, October 1.

Irving Joseph Weiss, Callender, Iowa; Creighton University School of Medicine, Omaha, 1931; member of the Iowa State Medical Society; aged 33; died, October 17, of acute myelogenous leukemia.

David M. Brower, Ashland, Ore.; Willamette University Medical Department, Salem, 1888; past president of the Jackson County Medical Society; aged 81; died, October 27, of cerebral hemorrhage.

Homer Chambliss, Cairo, Ill.; Meharry Medical College, Nashville, Tenn., 1924; member of the Illinois State Medical Society; aged 40; died, November 8, in the Passavant Hospital, Chicago.

Clinton Hill Morgan, Knoxville, Tenn.; University of Tennessee Medical Department, Nashville, 1899; member of the Tennessee State Medical Association; aged 64; died, November 11.

Frederick William Winter, Adams, Neb.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1880; aged 87; died, November 12, in Lincoln of prostatic hypertrophy.

Roy Ulysses Stevens ● Kansas City, Mo.; University of Kansas School of Medicine, Kansas City, Kan., 1921; aged 48; died, October 30, in Excelsior Springs of carbon monoxide poisoning.

George W. Lamb, Philadelphia; University of the South Medical Department, Sewanee, Tenn., 1898; also a clergyman; aged 64; died, October 30, at the Episcopal Hospital of heart disease.

Edgar M. Harris, New Haven, Mich.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1897; at one time health officer; aged 64; died, November 7, of diabetes mellitus.

Sarah Shomer, Miami, Fla.; University of Michigan Medical School, Ann Arbor, 1931; aged 43; died, October 7, in the St. Francis Hospital, Miami Beach, of septicemia.

Oliver James Roskoten ● Peoria, Ill.; Rush Medical College, Chicago, 1882; an Affiliate Fellow of the American Medical Association; aged 81; died, November 5.

Earl E. Efner, Oroville, Wash.; Sioux City (Iowa) College of Medicine, 1901; member of the Washington State Medical Association; aged 64; died, October 6.

Thomas W. Taylor, West Point, Ga.; University of Georgia Medical Department, Augusta, 1892; aged 74; died, November 1, in the City-County Hospital, La Grange.

Andrew Tennyson Custer, Indianapolis; Indiana University School of Medicine, Indianapolis, 1908; served during the World War; aged 66; died, November 11.

John Nicoll Dimon, New London, Conn.; Long Island College Hospital, Brooklyn, 1883; aged 77; died, October 10, of chronic myocarditis and arteriosclerosis.

Charles T. Walton, Port Henry, N. Y.; Albany Medical College, 1886; aged 80; died, October 31, of influenza, hypostatic pneumonia and multiple arthritis.

Frank Shapiro, New York; Long Island College Hospital, Brooklyn, 1915; member of the Medical Society of the State of New York; aged 52; died, October 27.

George Leslie Lyne, Medina, Ohio; Dartmouth Medical School, Hanover, N. H., 1896; aged 71; died, November 10, of arteriosclerosis.

Ulric Antonio Bedard, Kankakee, Ill.; Rush Medical College, Chicago, 1894; aged 73; died, November 11, of coronary thrombosis.

Bureau of Investigation

A "DIABETES CURE" FRAUD

"Dia-San" Concern Debarred from the Mails

A "diabetes cure" put out under a number of names and claimed to be "a formula of herbs used in Germany's great hospitals" has been debarred from the mails by the issuance of a fraud order against the Dia-San Laboratories, Inc., Dia-San Corporation and Albert Hofmann, president, of Fort Wayne, Ind.

The "cure" was sold under such designations as "Hofmann's Medicinal Natural Herb Tea," "Dia-San," "Dia-San Diuretic B 212," "Dia-San Herb Tea 212" and "Original Old Country Dia-San B 212." The Post Office Department reported that the business was started in 1930 and that though the concern's titles and literature indicated that it was incorporated, Hofmann informed that department that it was not, and that he was the sole owner of the enterprise.

Many of those who inquired of Hofmann about the treatment received a form letter reading in part:

> A few years ago some nationally known chemists of Germany prepared a combination of herbs found in that country and in Eastern Europe for the treatment of Kidney and Bladder troubles. This preparation grew into such favor that most of the great health centers of Europe are now using it.
>
> The formula has been obtained and the herbs are imported at present and the preparation is now available in the form of DIA-SAN DIURETIC B 212. This was formerly called Original Old Country Herb Tea B 212.
>
> DIA-SAN contains beneficial Herbs, the extract of which is in constant use by physicians and hospitals. This particular combination of herbs, blended to soothe irritated mucous membranes, gives us a formula that may be used with great benefit in DIABETES, RHEUMATISM, BRIGHT'S DISEASE . . . Kidney and Bladder disorder, Backache, Headache, Leg Pains—Swelling, Dizziness or Defective Vision, yield quickly to the DIA-SAN Treatment. . . . We make no false claims for DIA-SAN. It will do just what we say it will. We desire to help you and convince you that famous DIA-SAN is a wonderful remedy. . . .

And finally, in a booklet:

> Like harmony in music, so blended is the flavor in our remedy. DIA-SAN contains medicinal power as well, and is very beneficial to the user. It is a New Discovery in the art of preparing, blending and combining herbs for taste as well as usefulness . . . The Herbs are imported from Germany and carefully compounded to make a palatable diuretic.

The booklet represents that the product is good not only for "diseases of the urinary organs" but also for "diseases of the prostate," "dropsical and renal disease," "gonorrhea" and "heart diseases." Of course there are the usual testimonials.

Microscopic analysis of the stuff by government chemists is said to have shown that it consisted of the leaves of buchu, bearberry and mint, stems of horsetail herb, anise seed, licorice root, beans, corn silk, wintergreen, and traces of other herbs not named.

Hon. Vincent M. Miles, Solicitor for the Post Office Department, in his memorandum recommending that the Postmaster General debar the thing from the mails as a fraud, cited medical evidence that, while the mixture when used as directed would be slightly laxative and by irritating the kidneys might slightly increase the flow of urine, such increase would have no valuable effect in removing the various poisons from the blood stream; that it would have no beneficial action on diabetes and that gout, rheumatism, neuritis and prostatitis arise from various causes such as venereal diseases and foci of infections, all of which would be affected by this nostrum; and that there is no known drug or combination of drugs that will be effective in all cases of high blood pressure, kidney and bladder troubles, disorders of the prostate gland, dropsical and renal diseases, gonorrhea, and heart trouble. Nevertheless the Dia-San treatment was represented to cure or benefit all such conditions and to enable the victims of them to regain and retain "lasting" good health.

The memorandum also brought out that Mr. Hofmann was born in Germany forty-five years ago, came to America in 1923 and took out first papers for citizenship but never proceeded further; that in addition to his nostrum business he works as a knitter in a knitting plant in Fort Wayne, and that neither he nor any one else connected with his nostrum business possesses any medical knowledge. In addition, Judge Miles's memorandum referred to a case in which *Alfred* Hofmann, trading as the Original Old Country Remedy Co., was prosecuted in 1934 under the Food and Drugs Act for selling his "Old Country Dia-San" in interstate commerce under fraudulent claims. The defendant (presumably the *Albert* Hofmann mentioned in the fraud order) pleaded guilty but, also pleading poverty, was fined the ridiculously small sum of 5 cents!

In the Post Office investigation Hofmann claimed that the cited misrepresentations for his product had been discontinued a long time ago, but the government presented evidence that even "within recent months" Hofmann had sent out literature soliciting the purchase through the mails of the treatment for the diseases mentioned. Accordingly, a fraud order was issued on May 8, 1939, covering the names Dia-San Laboratories, Dia-San Laboratories, Inc., Dia-San Corporation, Albert A. Hofmann and Albert Hofmann, President.

A "GOITER CURE" FRAUD FROM MONTREAL

Lemmert Nostrum Debarred from United States Mails

A Canadian "goiter cure" advertised in periodicals in this country has been barred from the United States Mails by the issuance of a fraud order against a Mrs. Emma Lemert (or Lemmert) of Montreal.

The memorandum on the case issued by Hon. Vincent M. Miles, Solicitor for the Post Office Department, quoted a typical advertisement:

> GOITRE "External Treatment. Will bring prompt relief. Many testimonials Free Booklet.
>
> EMMA LEMMERT REG. Box 734, Montreal, Canada."

Many of those who answered it received a printed letter reading:

> Dear Sir or Madam:
>
> We take pleasure in sending you our booklet concerning goitre. Read it carefully, it will interest you. You will find in it copies of a few certificates from persons who have been cured with our treatment.
>
> This goitre cure will not only remove the tumor, but all symptoms which affect goitre sufferers will also disappear. It will be impossible for anyone to detect that you ever suffered with goitre.
>
> We hope that you will be convinced that our treatment can do for you what it has done for so many others, and that we will soon be able to put your name on our list of patients whom we have cured.
>
> When ordering, please fill the questionary enclosed herein.

The booklet mentioned was a small six-page leaflet in which Mrs. Emma Lemert used a supplementary title, "Mde. Marie Girardin," and claimed "Over 25 years of success" with "this wonderful goitre cure," which she also described as "an external treatment so everyone may use it, without any fear of bad effects . . . it has cured the worst cases . . . quite different of all the other treatments . . . since 1914, when this treatment was offered to the public, hundreds of people of all parts of America were cured with that remedy . . . Mrs. Lemert's Treatment will not only remove the tumor, but all symptoms which affect goitre sufferers will also disappear (such as Protruding Eyes, Heart's Palpitations, Nervosity, Etc.) after using this wonderful treatment."

There were testimonials, alleged to have come from persons claiming to have used the preparation and to have been completely cured of various types of goiter.

The treatment was sent out in small metal boxes, each full box containing about one ounce, to be used daily. Users were directed to apply it at bedtime after washing the throat with lukewarm water, then massage the throat and finally apply the ointment, which, covered with cotton, was to be left on over night, and part of the next day if possible.

Chemical analysis of the ointment was reported to reveal that it consisted of a sulfonated bitumen (ichthammol) in a lanolin base. Iodine or alkaloids were not detected.

Judge Miles's memorandum cited the medical evidence in the case as showing that in some simple colloidal goiters iodine may be helpful, whereas iodine was not found in the Lemert "cure." The evidence further showed that large adult goiters or other tumors of the thyroid gland, regardless of type, are never removed by external application of medicines or, in fact, by any other means than surgery, radium or the roentgen ray. The memorandum pointed out that many tumors at the side of the neck may be malignant and frequently cancerous and that the delay caused by the use of Mrs. Lemert's nostrum might prevent the patient from obtaining proper treatment and even result in death.

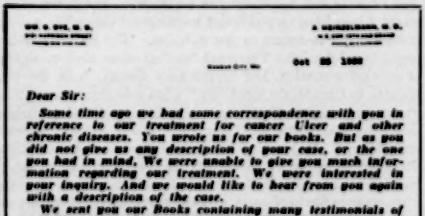
On April 3, 1939, the United States mails were closed to this Canadian fraud.

A "SYPHILIS CURE" FRAUD

Heinzelmann Company of Kansas City Is Banned from Mails

The sordid story of a "cancer specialist" who also promoted a "syphilis cure" is revealed in a fraud order by which the Post Office Department has debarred the Heinzelmann Company, of Kansas City, Mo., from the use of the mails.

This enterprise was started in 1924 by an Arthur Heinzelmann, who obtained a medical degree in 1907 from the Eclectic Medical University, of Kansas City, a low-grade school long since closed. Previously Heinzelmann's name had appeared as "superintendent" on the letterhead of the Cliff View Sanatorium of Kansas City, a "cancer cure" institution. Later he joined a William O. Bye of unsavory repute in another Kansas City cancer cure scheme. This combination and the nature of the business are best illustrated by the following letter sent in 1922 to an inquirer, who forwarded it to the Bureau of Investigation:



Oct 25 1922

Dear Sir:

Some time ago we had some correspondence with you in reference to our treatment for cancer Ulcer and other chronic diseases. You wrote us for our books. But as you did not give us any description of your case, or the one you had in mind, We were unable to give you much information regarding our treatment. We were interested in your inquiry. And we would like to hear from you again with a description of the case.

We sent you our Books containing many testimonials of reliable people who were cured with this treatment from all over the country, and you were at liberty to write to any of them if you wished.

Our mild method of treatment appeals to elderly people who are unable to stand much pain, as you will see by the many testimonials in our Books. Our treatment is both local and constitutional, we do not advocate the use of the knife Radium or Xray in the treatment of cancer or Ulcer.

We some times visit the patient in their own home and examine them. Then we furnish them with the home treatment if they desire it, or if they are unable to come here for treatment. We require them to write to us once each week during the course of the home treatment? We enclose you another small Book showing what we have done for others. Read it carfully then hand it or send it to some one you know to be afflicted. Hoping that we may hear from you again, we are.

Very Sincerely Yours

Reproduction of letterhead and signature (reduced); body of letter reset in type.

Further details of the Heinzelmann-Bye business appeared in a report which the Bureau of Investigation published in THE JOURNAL, June 3, 1933.

Not content with limiting his nefarious activities to the cancer cure field, this individual started his syphilis cure fraud in 1924. The latter enterprise was called the Heinzelmann Company and sold through the mails a nostrum called "Dr. Heinzelmann's Remedy."

The first government agency to concern itself with this scheme was the Federal Trade Commission. On Dec. 26, 1937, the Commission announced that it had got Frances M. Heinzelmann and Etta Campbell, trading as the Heinzelmann Company, Kansas City, to sign a stipulation promising to cease representing that "Dr. Heinzelmann's Remedy," also known as "Blood Disease Formula," can be used by the sufferer at home with beneficial results regardless of the cause of the ailment or the length of time it has existed. *The defendants were reported as admitting that there is no blood disease for which their product could be considered a satisfactory remedy.*

Two years later, in the memorandum of Hon. W. E. Kelly, Acting Solicitor for the Post Office Department, recommending that the United States Postmaster issue a fraud order against the business, it is reported that after Heinzelmann died in April 1936 the scheme was continued by his widow, Mrs. Frances M. Heinzelmann, with the aid of a physician, not named, until September 1936, when Mrs. Etta Campbell became a silent partner.

The memorandum states further that after an investigation of the enterprise by a Post Office inspector the concern was called on to show cause why a fraud order should not be issued against it for selling its product through the mails under the false and fraudulent representations that it would "free" victims of syphilis, of that "terrible disease" and prevent locomotor ataxia, organic heart disease, paresis, blindness, the birth of syphilitic children and other afflictions and conditions incident thereto. No fraud order was issued at that time, however, because certain statements made by Mrs. Heinzelmann and other evidence indicated that the preparation was not being sold through the mails for the treatment of syphilis.

These statements and "other evidence," however, must have been spurious or at least misleading, for it was found later that letters urging the purchase of additional medicine were addressed by the promoters of the scheme to customers who had previously purchased the remedy as a syphilis cure. The later evidence showed, in fact, that the promoters were *"continuing" to offer to sell the cure* through the mails as a *treatment for "bad blood" resulting from syphilis*, anemia, malaria, pellagra, gonorrhea, tuberculosis and some other conditions. All this in spite of the fact that two years previously Mrs. Heinzelmann had admitted to the Federal Trade Commission that the product was good for nothing.

Analysis by government chemists was said to show that the Heinzelmann nostrum was composed of sodium iodide, alcohol, sugar and plant extractives, including bitter principles, tannins and saponins. Expert medical evidence was produced to show that the term "bad blood" is frequently used by laymen to describe a condition resulting from any number of diseases, including syphilis, pellagra, gonorrhea, tuberculosis and anemia, but that "purifying" such "bad blood" requires treatment of the cause thereof, a procedure which necessitates careful diagnoses based on examination of the patient in person and in some cases on laboratory tests. Moreover, it was pointed out that, on arriving at a diagnosis, the physician must adapt his treatment not only to the special disease found to be present but also to the stage to which it has progressed and to the patient's individual needs.

The medical evidence further showed that, despite use of the Heinzelmann treatment by persons afflicted with syphilis, the blood and spinal fluid tests would remain positive and the condition would progress, with paresis and locomotor ataxia as possible after-effects. Also the evidence showed that the Heinzelmann treatment was not in itself a competent treatment for the other conditions in which it was supposed to "purify" "bad blood." Mrs. Heinzelmann denied that her "remedy" was sold for these conditions mentioned and claimed that it was promoted only for its "tonic properties"; and, further, that the business was "decreasing rapidly." These statements were contradicted by evidence which, Judge Kelly declared, showed that the business was a scheme for obtaining money through the mails under false and fraudulent pretenses and promises. Accordingly a fraud order was issued against it on April 1, 1939.

Correspondence

GLAUCOMA: A MEDICAL PROBLEM

To the Editor:—In civilized countries glaucoma takes first place among the causes of blindness. De Grosz says that more blindness results from this disease than from syphilis, tuberculosis, gonorrhea or even injuries. Yet there is no subject affecting the eyes which is less understood or for the prevention of which less is being done. The communication in THE JOURNAL Nov. 26, 1938, asking whether the views of Magitot on the origin of glaucoma were generally accepted was important.

Magitot is one of the most eminent French ophthalmologists. He was one of four reporters on glaucoma at the thirteenth Ophthalmologic Congress, the Netherlands, 1929, and the summary of the views he expressed was embodied in papers through four succeeding numbers of the *Annales d'oculistique*. These views were not generally accepted by the medical profession. One reason why they are not more widely accepted is that they are not generally understood. Magitot, writing in French, is not accessible to the majority of English readers. While he has been the guest of great medical societies in this country, his writings usually appear in French periodicals. These are not commonly read by American physicians, and abstracts are inadequate to give their full import. Beard's translation was a valuable addition to our knowledge of this subject.

The accepted view by ophthalmologists is that glaucoma is a disease characterized by increased tension of the eyeball, that this is produced by a narrowing or closure of the pathways of exit of the fluids from the anterior part of the eye and that, failing reduction of this tension by the use of myotics and more especially pilocarpine, an operative procedure relieving this tension is the only means of relief.

Magitot and a growing number of writers are accepting the view that the closure of the anterior pathways is due to an increase in the amount of the intra-ocular fluids and is a consequence rather than a cause of the disastrous series of events which follow.

A theory is only of academic value unless it has a practical application. Acceptance of the view that the obstruction is mechanical and can be relieved only by mechanical measures not only shuts off the consideration of other means of relief but also closes the mind to the acceptance of possible causative conditions which might be governable.

The importance of an understanding of this matter far transcends the acceptance or the rejection of a theory. Some of these points Magitot has elaborated in the first number of the *Acta ophthalmologica* of the current year in a paper of some seventy pages. Whether this view is correct or not, it opens a wide field for further research and the adoption of other clinical measures before the period has arrived in which operative measures become imperative. The prodromal symptoms often extend through a period of years and it is their early recognition which is important. When accommodation becomes uncertain, when it is difficult to see after dark, when there are occasional phosphenes before the eyes and temporary clouding, all these may indicate transitory intra-ocular pressure. These are known to be increased by emotions, by excesses, by physical disturbances, by focal infections and by other controllable causes. These and other symptoms are frequently overlooked even in our best clinics, and are not adequately emphasized in most of our textbooks, during a time in which relief is possible. It is during this period that treatment can be most effectively applied, and it is then that it is most commonly overlooked. It is unquestionably necessary that every glaucomatous eye should be subject to constant supervision by one adequately trained to measure the tension, to take visual fields and to study eyegrounds. But this should be carried out in closest cooperation with the internist, who takes into account such general physical changes as may be found to be present.

As Edward Jackson has well put it, "The common belief that glaucoma means either operation or blindness is not correct. We must admit there is something besides operation that can cure glaucoma. To determine what this something is, is a proper subject for investigation and experiment." But the unnecessary eye mortality due to glaucoma will not be limited until the public and the medical profession at large are taught to recognize the early symptoms of the oncoming of glaucoma before pathologic changes occur and while there is still a possibility of saving the sight.

PARK LEWIS, M.D., Buffalo.

THE HIPPOCRATIC OATH

To the Editor:—I was surprised to read the editorial "A New Interpretation of a Paragraph in the Hippocratic Oath" in THE JOURNAL November 4. The "new interpretation" is meaningless and not in accord with the spirit of the rest of the oath. It vitiates one of the most important paragraphs in the entire oath.

The scholar who suggests this interpretation is more of an etymologist, lexicographer and perhaps syntaxologist than a philologist. Yet I suspect that he will receive a vote of appreciation from practitioners who are "cutting persons suffering from a stone" instead of "leaving it to practitioners of that art," because this "interpretation" would put a final quietus on their conscience for doing so.

It is a well recognized fact that words denote, connote and have a figurative meaning. Sometimes a word is used for one of these reasons, sometimes for another, and taken in the context may have very different meanings. "Cut up" in a salad recipe means to reduce to fine particles. "Cut up" also means capricious behavior. The word "cut" is often used to signify a surgical operation, and in the Cow County, from the Rio Grande to Canada, the word "cut," when referring to an animal, means to castrate. One who carries out a surgical procedure is known as an operator. The proprietor of a pool hall is called an operator. An agent of the Federal Bureau of Investigation is called an operator. Some post-meta-scholar, two thousand years from now, might say that in the United States of today the secret police performed surgical procedures and were proprietors of pool halls.

In "interpreting" a word when several alternatives are possible, one must be guided by the spirit and general meaning of the entire manuscript. This is a well recognized principle in law. Applying this to the paragraph in question, one must first get the spirit of the "oath." "I will teach medicine to those who are properly qualified and to none others." "I will use that treatment which is for the benefit of the patient . . . and refrain from voluntary acts of mischief and corruption." "I will not give a woman an instrument with which to produce an abortion." In no place does it say I will not associate with unqualified students, quacks, charlatans and abortionists, all of which I will not do, but "with purity and holiness I will live and practice my art."

In this paragraph in the oath, granted that the word in question means to castrate and that only, if Hippocrates did not approve of castration while operating for a stone this part of the paragraph would mean "I will not castrate a person while removing a stone." But if this is considered in connection with the latter part of the sentence "but will leave it to practitioners of that art," it is clear that Hippocrates must have used the word in a figurative sense or, since and if such mutilation was a common practice, he used it because it was common but as an example to make plain an important and thoroughly hippocratian ethical principle: if I am to treat for the benefit of the patient, abstain from voluntary acts of mischief, live and prac-

tice in purity and holiness, honored by all men. That principle is "I will not attempt procedures which I am not qualified to perform but will leave them to those who are qualified." If medical men today would make that paragraph a part of their daily work, they as individuals and the medical profession as a whole would be more honored by all men, and some patients would not be hurried to their graves because medical men did not leave to practitioners procedures which they themselves were not qualified to carry out.

All the scholars who have translated the oath from the time of Hippocrates have not been mistaken. I hope that the "new interpretation" never finds its way into the official printed oath.

L. A. TURLEY, PH.D., Oklahoma City.
Professor of Pathology and Lecturer on History of Medicine, University of Oklahoma School of Medicine.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

LEAD AND ARSENIC IN TOBACCO

To the *Editor*:—In the annual cumulative issue of *Consumer's Research Bulletin* for Sept. 4, 1939, the statement was made that the lead content of five brands of cigaret was found to vary from 11 to 30 parts per million and that the arsenic content varied from 6 to 14 parts per million. The brands tested were Camels, Lucky Strikes, Pall Malls, Marvel and Lord Salisbury. Are these ranges of values for arsenic and lead too high for safety for one who smokes one packet of cigarets daily? Are these values correct ones and if not what are correct values?

M.D., Pennsylvania.

ANSWER.—In a recent article two Canadian investigators (Zeidler, F. A. J., and Wagner, W. J.: The Lead and Arsenic Content of Canadian Domestic Tobaccos, *Canad. Pub. Health J.* **30**:582 [Dec.] 1937) reported an average of *22* parts per million of lead to the package of domestic cigarets. Nine analyses of oriental tobaccos showed an average lead content of 2.5 parts per million to a package. The arsenic content of these tobaccos was not determined but the authors estimate that it may amount to about one half of the lead content, or 11 parts per million per package of domestic tobaccos. These amounts of lead and arsenic in tobacco are attributed chiefly to the lead arsenate used as an insecticide for the horn worm, the wire worm and the flew bettle. Some tobacco leaves contain 100 times the lead tolerance placed by the United States government on foods. This varies from year to year and place to place depending on the requirements for insecticide. Although tobacco is an agricultural product, the restrictions placed on foods have not been applied to tobacco with comparatively high contents of lead and arsenic.

Lead and arsenic may enter the system during smoking by inhalation and by ingestion secondary to solution in the saliva and mucus. It has recently been shown that saliva dissolves five times as much lead arsenate as blood serum. The actual amount of lead and arsenic dissolved in saliva and swallowed during smoking is not known.

Some investigators have reported on the amounts of lead and arsenic volatilized from tobacco during smoking. Gross and Nelson (Arsenic in Tobacco Smoke, *Am. J. Pub. Health* **24**:36 [Jan.] 1934) found that the average arsenic content of unnamed American brands was 114 parts per million to the package. A little more than one third of the arsenic was volatilized during smoking but only 10 per cent was found in the puffed smoke. A considerable portion of the arsenic remains in the unburned tobacco, is volatilized in the unpuffed smoke and is absorbed by the tobacco in the butt. It has been computed that one fifteenth of the total lead present in cigarets is found in the puffed smoke.

How much lead and arsenic constitutes a daily toxic dose is a controversial question. It is a complicated problem. The safe limit of lead in air breathed has been set by the United States Public Health Service and the National Safety Council as between 150 and 600 micrograms per cubic meter of air. The oral daily toxic dose of lead as given in the literature varies from 100 to 1,000 micrograms. The lead tolerance placed on foods by the United States government is about 2.5 parts per million and the arsenic tolerance is 1.06 parts per million, both expressed as the elements. If one fifteenth of the lead and arsenic is inhaled in the smoke of one cigaret and the tobacco contains 22 parts per million of lead and 11 parts per million of arsenic, and an average package of cigarets contains 21 Gm. of such tobacco, the lead inhaled as an oxide will amount to 70 micrograms and the arsenic roughly to 35 micrograms. This value for lead is approximately one half of the lower limit established by the United States Public Health Service for lead in air. These approximate calculations may indicate the desirability of further study of the lead content of the air in rooms filled with tobacco smoke. How much lead or arsenic is actually taken into the body, retained and excreted on exposure to tobacco smoke containing lead and arsenic has not been determined. It is not likely that one could obtain a toxic dose of lead or arsenic from smoking one package or even several packages of cigarets daily; but because these toxic elements are cumulative, the possibility of the relationship of tobacco to poisoning with such heavy metals should not be overlooked.

WARTS AND MILKWEED

To the *Editor*:—I have been informed by several patients that the fluid which can be expressed from the stems and leaves of the milkweed has a curative effect when applied to verrucæ, or the common household variety of warts. I have seen this work to perfection in one case. Is there any known substance found in the milkweed or elsewhere which has this therapeutic property? In the case mentioned eight applications on alternate days caused the wart to disappear.

Oscar J. Horak, M.D., Galeton, Pa.

ANSWER.—It is not likely that noncauterizing local applications have any direct effect on warts. In spite of the recent discovery at the University of California that milkweed juice contains a proteolytic enzyme, it seems unlikely that it can penetrate the horny armor of a wart. Until new light has been shed on this question it must be held that the milkweed juice treatment of warts remains in the controversial field discussed in answer to a query in THE JOURNAL Jan. 18, 1936, page 235. The skeptic claims that these cures are mere coincidences. The warts heal spontaneously at the proper time to give credit to the milkweed juice. The believers maintain that the spontaneous disappearance of warts does not occur with anything like the frequency with which cures by psychotherapy are effected by those who are adept at this treatment.

Dermatology waits with eager anticipation for the discovery of something in milkweed juice or elsewhere that will cure warts with certainty and without scarring.

CRANIAL NERVES AND CEREBROSPINAL SYPHILIS—ADIE'S SYNDROME

To the *Editor*:—In the course of my practice I have examined several patients who present signs which I have been taught are suggestive of syphilis of the central nervous system. Some have a history of previous syphilitic infection, others do not but admit likelihood of exposure. These signs are usually those of involvement of the cranial nerves, as evidenced by sluggish or fixed pupils, smooth forehead with inability to control "wrinkling," facial tremor and inability to control facial muscles, with perhaps some difficulty in repeating test phrases, and the like. I have made it a routine practice in these cases to obtain a spinal fluid examination, which is frequently entirely negative. I am convinced that these patients have some syphilitic involvement and am at a loss to account for the infrequency of corroboration in the spinal fluid. The blood Kahn reaction is sometimes positive and sometimes negative. These experiences have given rise to several questions in my mind: 1. How long after the signs of cranial nerve involvement appear does the spinal fluid show changes either characteristic or suggestive of syphilis? 2. May cerebrospinal syphilis exist with an entirely normal spinal fluid? 3. Is it possible that other diseases may cause cranial nerve involvement, and if so what is the chance that such involvement is due to other diseases rather than to syphilis? 4. I was recently informed by a fellow physician of a syndrome called "Adie's" syndrome, in which fixed pupils have been present from birth. I should like more information on this disease.

George B. T. Ribble Jr., M.D., Philadelphia.

ANSWER.—The signs mentioned, in the absence of other confirmatory neurologic evidence and in the presence of a negative serum reaction, are in themselves not sufficient evidence on which to base a diagnosis of neurosyphilis.

1. It is the rule that the spinal fluid is positive for evidence of syphilis before the cranial nerve involvements have appeared. In other words, cranial nerve involvements are frequently a manifestation of a meningeal type of neurosyphilis, in which the spinal fluid is usually strongly positive at the time of the appearance of the cranial nerve lesions and remains so for some years thereafter.

2. Cerebrospinal syphilis may exist with an entirely normal spinal fluid. The so-called burned-out tabetic is an example of

this finding. In fact, 5 per cent of patients who have tabes dorsalis belong in the so-called burned-out group; or, in other words, individuals who manifest classic signs of tabes but in whom the serum reaction is completely negative and who have never received antisyphilitic treatment. Of course, the patient in whom the tabes is "burned out" as a result of treatment is quite commonly seen.

3. Other diseases may cause cranial nerve involvement, such as residues of mild types of encephalitis.

4. Adie's syndrome is of unknown origin. The patient has dilated pupils, which do not react to light and only slightly to convergence. It is usually associated with absence or decrease in the deep reflexes. It is not related to syphilis; it is frequently a family characteristic and is not progressive and usually causes the patient no inconvenience.

FACIAL HYPERTRICHOSIS

To the Editor:—What is the cause, if known, and the treatment, if any, of facial hypertrichosis in an otherwise normal unmarried girl of 24? The patient's past history is essentially normal except for the usual childhood diseases and an appendectomy two years ago when, the patient assures me, only the appendix was removed. The menarche occurred at 14; the menses have since been regular, with minor variations of four or five days' duration, moderately profuse and without pain. The facial hair has developed since adolescence. It is soft, fairly long and most marked on the upper lip and chin. Physical examination reveals no other abnormalities except a masculine distribution of pubic hair. The external genitalia and secondary sex characteristics are entirely normal. The internal genitalia are said to be normal on pelvic examination. The girl's libido and interests are entirely female. The problem appears to be a cosmetic one. Any advice would be appreciated.

M.D., New York.

Answer.—The causes of facial hypertrichosis in the young woman are undoubtedly bound up in part with the state of the glands of internal secretion. Just which glands are most influential and the exact balance necessary among their secretions to produce these changes in the facial hair are not entirely known. Tumors of the cortex of the adrenal gland have been found in some patients with hypertrichosis. Enlargement of the adrenal gland, however, is not always present nor is the excretion from the cortex known to be increased in every case. Certain ovarian tumors may be associated with hypertrichosis.

A number of methods have been used for the removal of these hairs. The x-rays have been used, but, to be effective, this method requires doses beyond the safe tolerance of the skin. Dangerous sequelae are apt to occur some time after such treatment. At present, all responsible persons are emphatic in saying that x-rays should not be used for the epilation of facial hair for cosmetic purposes.

Several methods which are safe to use are bleaching of the hair with an agent such as hydrogen peroxide solution to make them less conspicuous, epilation with forceps, the use of an epilating wax and finally electrolysis. The electrolytic method properly done is a safe procedure and removes the hairs permanently. It is expensive, takes a long time and is somewhat painful. For many patients it is the most practical method.

ANAL SPHINCTER CONTROL AFTER OPERATION

To the Editor:—A patient had an operation for rectal fistula five months ago. The internal opening was high, above the external sphincter, necessitating a division of the external sphincter. This was done once, at right angles to the fibers. For a time she naturally had no control but as healing took place this gradually returned, though not completely. She came to the office recently, complaining of some lack of control. Examination of the anal area shows the normal puckering of the skin around this area. Rectal examination shows some sphincteric action, but not tight enough to be termed a normal control. What can be done to correct this condition and what are the prospects of the control coming back to normal without any further treatment?

M.D., Illinois.

Answer.—The external sphincter muscle is anchored by the sacrococcygeus muscle directly in the posterior line. The sphincter muscle may be cut in this line without a repair and there will usually be a good return of function. If the sphincter muscle is cut in any other quadrant and is not repaired immediately, there is usually enough retraction of the cut ends so that control of the sphincter is poor. If there is a hiatus between the ends of the muscle in the depth of the scar, the ends of the muscle should be dissected free from the enveloping scar tissue and each end of the muscle should be anchored to the bottom of the wound by mattress sutures so that the ends are approximated and cannot retract. In most cases this gives a good return of function. Function will probably not improve much spontaneously at this late date.

VACCINIA VIRUS IN EYE

To the Editor:—To what extent is the eyeball endangered following accidental splashing of potent smallpox vaccine into the eye? To what extent is this danger increased by superficial abrasions of the bulbar conjunctiva sustained about a week earlier? What besides irrigation would constitute prophylaxis? I am aware that bulbar involvement can occur in generalized vaccinia and is deliberately achieved in animal inoculations, as in Paul's test.

M.D., Arizona.

Answer.—Splashing of vaccinia virus into the eye may be classified as a vaccination injury or unintentional infection with vaccine. The infection may occur either with animal lymph or with human lymph from an accidentally ruptured pustule on the vaccinated person.

If the infection occurs in a susceptible person, the resulting pustule will resemble a primary vaccination. If the patient has been previously vaccinated, the lesion will assume the character of a revaccinal lesion.

In order that accidental vaccination may occur, an injury or a break in the skin or mucous membrane must be present.

Accidental vaccination as a lesion of the eye occurs most frequently in persons suffering with eczema. An eczematous palpebral margin is a favorite site for such a lesion. If the infection is confined to the palpebral margins, healing may take place without scar formation. However, if epithelial defects occur, involvement of the conjunctivas and cornea occurs also.

Prophylaxis against accidental vaccination should consist of refusal to vaccinate whenever such cutaneous conditions as eczema, impetigo contagiosum and other forms of dermatitis are present.

In a case of accidental splashing of vaccine into the eye as noted in the query, a prompt irrigation of the eye with physiologic solution of sodium chloride or sterile water would probably be the most suitable prophylactic measure which could be undertaken. Any traumatizing procedure which might injure the conjunctival epithelium should be avoided.

IRRADIATION OF ADRENALS FOR HYPERTENSION

To the Editor:—Please discuss irradiation of the adrenal glands for essential hypertension. I am sure a patient of mine has too much internal secretion from the adrenal glands, and treatment by x-rays ought to give as good results as irradiation of the pituitary gland for oversecretion. The patient is a man aged 48 of florid complexion and perfectly well in every way so far as study in a hospital can determine and it is a definite essential hypertension. While 30,000 units of estrelin controls the blood pressure it does not cure the condition, and if we could decrease the adrenal activity I believe we can cure this man. Can you give any information relative to irradiation of the glands in question for such a condition?

O. F. McKittrick, M.D., Linglestown, Pa.

Answer.—The most extensive studies of irradiation to the pituitary and adrenal areas in hypertensive disease are those of Hutton (*Radiology* **24**:330 [March] 1935; *Clinical Med. & Surg.* **44**:533 [Dec.] 1937). Distinct and encouraging subjective improvement is reported in about one half of the cases so treated. The objective reduction of the arterial tension is less striking. What reduction does occur is usually quite temporary. These observations have not as yet been fully confirmed by other investigators.

The recommended dose is small. The results with larger doses have been definitely less encouraging. Larger doses induce headaches, vertigo and nausea, and the arterial tension is less effectively reduced. Each side of the pituitary was treated with 50 roentgens, 120 kilovolts, 2 mm. of aluminum filter, 50 cm. skin target distance, 3 milliamperes for five minutes. The adrenals were irradiated through a single portal of 15 by 15 cm. with the same exposure. Such irradiation, although small enough to assure against gross damage, should not be given more frequently than once a week or in courses over six consecutive weeks. In women this radiation therapy should never be administered closer than one week prior to an expected menstrual period. More frequent or more intense therapy is prone to fail even in carefully selected cases. Hutton recommends that the two sides of the pituitary and the adrenal area be irradiated on the same day.

Though these and a few other reports are suggestive that such radiation therapy, if properly controlled, may prove to be an adjunct in the management of hypertensive arterial disease, the data are inconclusive. The role of endocrine imbalance in the etiology and pathogenesis of hypertension is but poorly established. A diagnosis of hypertension as due to "too much secretion of the adrenal glands" seems hardly justified on the purely negative evidence implied in the present case. One does not share the conviction that this is so major a factor in the etiology. Hypertension may be provoked in many different ways and etiologic diagnosis is frequently difficult and laborious.

However, guesswork and assumption should be reduced to a minimum. The hypertension of adrenal adenomas is associated with characteristic episodes of crisis, with extreme variability of the tension. In so-called essential hypertension there is no convincing evidence that adrenal hypersecretion plays any significant etiologic part.

While radiation therapy in this or any other instance of hypertensive disease is not recommended, the small doses advocated by Hutton are apparently quite safe. The transient nature of the reduction of the arterial tension following such irradiation implies that the fundamental origin of the disorder has not yet been reached.

CELL COUNTS FROM OXALATED BLOOD

To the Editor:—Can the red and white blood cells be counted in oxalated blood? Can a differential white count be made? If so, how long can the blood be left before these counts are made?

M.D., Tennessee.

ANSWER.—Red and white blood cell counts may be done with oxalated blood. One or two cubic centimeters of blood is drawn from a vein with a dry syringe and needle and placed in a small tube, a small medicine glass or a shallow Petri dish which contains a mixture of dry ammonium and potassium oxalate crystals. The blood is stirred well by gentle shaking to prevent clotting and clumping. Red counts and white counts made from a solution of this type are accurate for several hours after the blood is drawn but should be stirred gently immediately before the filling of the pipet.

For the making of smears for differential counts, blood obtained in this way probably is not as good as blood obtained from a puncture of an ear lobe or a finger. Oxalated blood has a tendency to cause slight pyknosis of the red cells as well as the white cells, and in particularly important cases there may be some difficulty in obtaining adequate detail in the various types of cells.

Frequently blood is drawn as a routine from a vein for a Wassermann test and a blood chemistry examination, and 2 cc. is placed in a separate vessel for the carrying out of a complete blood count.

Osgood recommends this method and finds it satisfactory both for cell counts and differentials. Many others feel that red counts and white counts may be done with accuracy on oxalated blood and for at least five or six hours after the blood is drawn, provided the fluid is kept at cool temperatures and that it is shaken well before the pipets are filled. Blood smears for differential counts should be made as soon as possible after the blood has been drawn into the vessel containing oxalate.

SODIUM AMYTAL DURING LABOR

To the Editor:—Relative to the administration of sodium amytal by rectum during labor, would you kindly inform me as to the following points: (a) How early in labor may it be instituted? (b) What is the dosage per injection? (c) What menstruum and what amount are used per injection? (d) What is the frequency of reinjection, safety being considered?

Joseph Libert, M.D., Huntington, N. Y.

ANSWER.—(*a*) Sodium amytal may be given as soon as labor is definitely established. (*b*) Six or 9 grains (0.4 or 0.6 Gm.) should be given by rectum as the first dose. Three or 6 grains (0.2 or 0.4 Gm.) may be repeated one or more times if the first dose is insufficient or the labor is prolonged. (*c*) The sodium amytal may be placed in 4 ounces (120 cc.) of warm water and this mixture placed in the rectum. (*d*) It is safe to reinject sodium amytal at the end of three hours. However, all patients who receive this drug must be watched constantly and carefully, and the repetition of the treatment should not be a matter of routine but should depend on each patient's reaction to the drug.

INFESTATION WITH FILARIA LOA

To the Editor:—A patient stated that he had been on the west coast of Africa in 1935 and had contracted Filaria of the Loa loa species. He has evidences of subcutaneous nodules and burrowings, and nocturnal appearances of worms in the conjunctiva. He has removed and brought me the worms. Will you please tell me if there is any specific treatment for this type of Filaria?

M.D., Illinois.

ANSWER.—None of the forms of chemotherapy have been strikingly successful in treating infestation with Filaria loa, though arsphenamine and antimony and potassium tartrate have been tried. When the worms can be seen under the conjunctiva or skin they can often be removed. Application of heat may be useful to bring them near the surface. Some surgeons have been successful in injecting a local anesthetic into the worm or near it, paralyzing it so that it will not escape. In other cases a suture is passed quickly beneath the worm through the conjunctiva or skin, or it is grasped by fixation forceps through the conjunctiva, after which it is removed through a small incision. This may have to be repeated a number of times, if several worms are present.

PARTIAL DESTRUCTION OF NAIL BED

To the Editor:—Because of a trauma, the distal half of the left thumb nail of a man is not adherent to the underlying tissues. He would like it remedied. If the surface of the underlying tissue should be denuded with acid or by mechanical means and a pressure dressing then applied, would the nail and tissue become adherent?

Hobart P. Shattuck, M.D., Los Angeles.

ANSWER.—Failure of a nail to adhere to the underlying tissues is invariably the result of injury and partial destruction of the nail bed. As a result of such injury this portion of the nail bed does not function in a normal fashion and does not take part in the formation of the growing nail.

To denude the tissues under the nail with acid or by mechanical means would simply cause further destruction and would be likely to result in an open wound, which would heal with difficulty and with formation of dense scar tissue. Unfortunately there is no logical reason for thinking that such a procedure would be of value.

PROBABLE SPRUE

To the Editor:—A white woman aged 50 has had aphthous stomatitis for the past two or three years, with oozing of blood from the tongue, which is sore and atrophic and beefy red. There is painful lymphadenopathy in the neck and a painful sensation in the epigastrium and chest. The gastric acidity is normal. The blood picture is normal: hemoglobin 80 per cent, red cells 4,400,000 and white cells 5,200. There is a yellowish tinge to the skin and she has had considerable liver therapy (parenterally) though the exact quantity is not known. The mucous membranes of the vagina present the same aphthous as noted in the mouth, and the cervix is red and beefy, oozing a bloody discharge on examination. The rectum presents a similar appearance. Cultures from the mouth and rectum on Sabouraud's heavy agar medium produced a creamy growth in four or five days, and microscopic examination showed some type of Monilia. The patient states that she has large foamy and foul-smelling stools at times, but the stools do not present this appearance at present, though she does pass streaks of blood and mucus. The condition is painful and there are spontaneous periods of improvement. There has been considerable loss of weight, though she is still not emaciated, as she was formerly overweight. 1. Is this a case of sprue? 2. Does the finding of Monilia in any way substantiate the diagnosis of sprue? 3. If this is probably not sprue, what steps might be taken to arrive at a satisfactory diagnosis? 4. What type of treatment would be indicated for such a case? She has had liver in considerable quantity, numerous vitamins, especially B1, pancreatin and hydrochloric acid, solution of parathyroid and calcium lactate. 5. Is the dextrose tolerance test of much importance in this condition?

M.D., South Carolina.

ANSWER.—1. This most likely is a case of sprue.

2. The finding of Monilia is believed by some authorities to substantiate the diagnosis.

3. As given.

4. The treatment outlined is quite comprehensive. It is assumed that the patient has had a proper, well balanced diet, which did not contain any of the ordinary sugar and cereals and was also low in its fat content. It might be wise to try potassium iodide in ascending doses, principally for its alterative action.

5. The dextrose tolerance test is of no significance in this condition.

INOCULATION OF CARCINOGENIC AGENTS IN MAN

To the Editor:—A laboratory technician has been working on mice and carcinogenic substances, particularly dibenzanthracene, benzopyrene, methylcholanteria and styryl. While working with these she was bitten by a mouse, and as her hands were quite covered with these substances she was rather thoroughly inoculated. Would you let me know the possible consequences of an inoculation of one or several of these substances.

M.D., Massachusetts.

ANSWER.—There is no available evidence to indicate that a single inoculation of the carcinogenic agents mentioned will produce a neoplasm at the site of injury.

CARD PLAYING BY COLOR BLIND

To the Editor:—Can a person who is color blind play cards?

Robert Boyd, M.D., Brooklyn.

ANSWER.—In all card decks the suits are distinguished as much by the form of the pips as by the color. Even if the red cards appear as a drab gray (it does to a real trichromat), the intensity of the hue is sufficiently different from that of the black cards to permit recognition even if unaided by the shape of the pips.

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Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, December 23, page 2344.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Medical centers having five or more candidates desiring to take the examination, Feb. 12-14. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. *Written.* Part I. Various places throughout the United States and Canada, March 28. *Oral.* Part II. New York, June 10-11. Applications must be received 60 days prior to examination. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: November 1940. *If a sufficient number of applications are received before March 1 there will be an examination at New York, June 10-14.* Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various sections of the United States, Feb. 19. Formal application must be received on or before Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *General oral and pathologic examinations (Part II) for all candidates (Groups A and B)* will be conducted in Atlantic City, N. J., June 8-11. *Applications for admission to Group A, Part II, examinations must be on file not later than March 15.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various cities of the United States and Canada, March 2. (The only written examination in 1940.) Oral. New York, June 8-10; Cleveland, Oct. 5. *Formal applications must be received before Jan. 1.* Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 3-5. Sec., Dr. W. P. Wherry, 1000 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: New York, June 10-11. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: Kansas City, Mo., May 18, following the Region III meeting of the American Academy of Pediatrics. Seattle, June 2. Sec., Dr. C. A. Aldrich, 721 Elm St., Winnetka, Ill.

AMERICAN BOARD OF UROLOGY: Chicago, Feb. 9-11. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

National Board of Medical Examiners

The National Board of Medical Examiners reports that its certificate was awarded 485 applicants who were successful in the examination in part III, held during June and July 1939. The following schools were represented:

School	PASSED Year Grad.	Number Passed
University of Arkansas School of Medicine	(1938, 2)	2
College of Medical Evangelists	(1936, 4), (1937),* (1937), (1938),* (1938, 10), (1939, 3),* (1939, 52)	72
Stanford University School of Medicine	(1939, 3)	3
University of California Medical School	(1939)	1
University of Southern California School of Medicine	(1938)	1
University of Colorado School of Medicine	(1934), (1936), (1938),* (1938, 4)	7
Yale University School of Medicine	(1935, 2), (1936),* (1936, 5), (1937, 5),* (1937, 12), (1938, 2),* (1938, 12)	39
George Washington Univ. School of Med.	(1937, 2), (1938, 12)	14
Georgetown University School of Medicine	(1935), (1936, 2), (1937), 5), (1938),* (1938, 20)	29
University of Georgia School of Medicine	(1938)	1
Loyola University School of Medicine	(1939, 3)	3
Northwestern University Medical School	(1935), (1937), (1938, 3), (1939, 5)	10
Rush Medical College	(1935), (1937,4), (1938, 4)	9
The School of Medicine of the Division of Biological Sciences	(1938, 3)	3
University of Illinois College of Medicine	(1939, 2)	2
State Univ. of Iowa College of Medicine	(1938),* (1938, 2)	3
University of Kansas School of Medicine	(1938)	1
University of Louisville School of Medicine	(1938)	1
Tulane University of Louisiana School of Medicine	(1936), (1937), (1938)	3
Louisiana State University Medical Center	(1938)	1
Louisiana State University School of Medicine	(1939)	1
Johns Hopkins University School of Medicine	(1935), (1936, 3), (1937, 2)	6
University of Maryland School of Medicine and College of Physicians and Surgeons	(1938, 2)	2
Boston University School of Medicine	(1937, 8), (1938, 18)	26
Harvard Medical School	(1930), (1935, 2), (1936),* (1936, 6), (1937, 13), (1938, 11)	34
Tufts College Medical School	(1937),* (1937, 8), (1939, 18)	27
Univ. of Michigan Medical School	(1933), (1937), (1938, 2)	4
Univ. of Minnesota Med. School	(1937), (1938, 3), (1939, 3)	7
St. Louis University School of Medicine	(1937), (1938, 8)	9
Washington Univ. School of Med.	(1936), (1937), (1938, 2)	4
Creighton University School of Medicine	(1938, 2)	2
Albany Medical College	(1935), (1937),* (1938,2),* (1938, 6)	10
Columbia University College of Physicians and Surgeons	(1929), (1936), (1937)	3
Cornell Univ. Medical College	(1936, 2), (1937, 5), (1938, 5)	12
Long Island College of Medicine	(1937, 5), (1938, 5)	10
New York Medical College and Flower Hospital	(1937, 3),* (1937, 4), (1938, 12)	19
New York Univ. College of Med.	(1936), (1937, 4), (1938, 3)	8
Syracuse University College of Medicine	(1937)	1
University of Buffalo School of Medicine	(1938, 5)	5
University of Rochester School of Medicine	(1938)	1
Duke University School of Medicine	(1936, 3), (1937, 2),* (1937, 16), (1938),* (1938, 13)	35
Western Reserve University School of Medicine	(1938)	1
University of Cincinnati College of Medicine	(1939)	1
University of Oklahoma School of Medicine	(1938)	1
University of Oregon Medical School	(1937), (1938, 2)	3
Hahnemann Medical College	(1938, 2)	2
Jefferson Medical College of Philadelphia	(1937, 3), (1938, 2)*	5
Temple University School of Medicine	(1937), (1938, 2)	3
Univ. of Pennsylvania School of Med.	(1937),* (1937), (1938)	3
Woman's Medical College of Pennsylvania	(1938)	1
Meharry Medical College	(1937)	1
Vanderbilt University School of Medicine	(1937)	1
Baylor University College of Medicine	(1937)	1
University of Texas School of Medicine	(1938)	1
University of Vermont College of Medicine	(1936), (1937, 2), (1938),* (1938, 4)	8
Medical College of Virginia	(1937)	1
University of Virginia Department of Medicine	(1938)	1
Marquette Univ. School of Med.	(1937), (1938, 2), (1939, 2)	5
University of Alberta Faculty of Medicine	(1938)	1
University of Toronto Faculty of Medicine	(1936), (1938, 2)	3
University of Western Ontario Medical School	(1938)	1
McGill University Faculty of Medicine	(1935), (1938)	2
Karl-Franzens-Universität Medizinische Fakultät, Graz	(1937)	1
Fried-rich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1925), (1931), (1936)	3
Ludwig-Maximilians-Universität Medizinische Fakultät, München	(1936)	1
Licentiate of the Royal College of Physicians and Surgeons, of the Royal College of Surgeons of Edinburgh, and of the Royal Faculty of Physicians and Surgeons of Glasgow	(1937)	1
University of Edinburgh Faculty of Medicine	(1937, 2)	2

* Certificates have not been issued.

Ohio October Endorsement Report

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports twenty-three physicians licensed by reciprocity and one physician licensed by endorsement October 3. The following schools were represented:

School	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
Northwestern University Medical School	(1930)	Minnesota
State University of Iowa College of Medicine	(1937)	Iowa
University of Kansas School of Medicine	(1935), (1936)	Kansas
Johns Hopkins University School of Medicine	(1938)	Maryland
University of Michigan Medical School	(1935), (1938)	Michigan
St. Louis Univ. School of Medicine	(1936), (1937), (1938)	Missouri
Columbia Univ. College of Physicians and Surgeons	(1937)	New York
Long Island College of Medicine	(1932)	New York
Syracuse University College of Medicine	(1935)	New York
University of Oregon Medical School	(1935)	Oregon
Jefferson Medical College of Philadelphia	(1931)	Penna.
Univ. of Pennsylvania School of Medicine	(1912), (1927)	Penna.
Western Pennsylvania Medical College	(1901)	Penna.
Medical College of Virginia	(1937)	Penna., Virginia
University of Virginia Department of Medicine	(1935)	Virginia
Marquette University School of Medicine	(1937)	Michigan
Université de Lausanne Faculté de Médecine	(1936)	New York

School	LICENSED BY ENDORSEMENT Year Grad.	Endorsement of
Georgetown University School of Medicine	(1938)	N. B. M. Ex.

Oklahoma June Report

Dr. James D. Osborn Jr., secretary, Oklahoma State Board of Medical Examiners, reports the written examination held at Oklahoma City, June 14, 1939. The examination covered twelve subjects and included 120 questions. An average of 75 per cent was required to pass. Forty-three candidates were examined, all of whom passed. Twenty-seven physicians were licensed by reciprocity and one physician was licensed by endorsement. The following schools were represented:

School	PASSED Year Grad.	Per Cent
Creighton University School of Medicine	(1938)	83
University of Oklahoma School of Medicine	(1938)	79, 83, (1939)* 78, 79, 79, 79, 79, 79.5, 80, 80, 80, 81, 81, 81, 81, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 86, 86, 87, 87

School	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1933), (1937, 4)	Arkansas
Rush Medical College	(1934)	Illinois
University of Louisville School of Medicine	(1938)	Kentucky
Tulane University of Louisiana School of Medicine	(1936) (1938) Louisiana	Tennessee,
Johns Hopkins University School of Medicine	(1938)	Maryland
University of Michigan Medical School	(1927)	Michigan
University of Minnesota Medical School	(1939)	Minnesota
Washington University School of Medicine	(1922), (1934), (1936), (1937) Missouri	
University of Cincinnati College of Medicine	(1936)	Ohio

Hahnemann Med. College and Hospital of Philadelphia (1938)	Maryland
Univ. of Tennessee College of Medicine..(1937), (1938, 2)	Tennessee
Baylor University College of Medicine.....(1936), (1938)	Texas
University of Texas School of Medicine.....(1937), (1938)	Texas
University of Virginia Department of Medicine.....(1934)	Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Harvard Medical School		(1932)	N. B. M. Ex.

* Licenses have not been issued.

Book Notices

Cancer of the Colon and Rectum: Its Diagnosis and Treatment. By Fred W. Rankin, B.A., M.A., M.D., Surgeon, St. Joseph's and Good Samaritan Hospitals, Lexington, Kentucky, and A. Stephens Graham, M.D., M.S., F.A.C.S., Surgeon, Stuart Circle Hospital, Richmond, Virginia. Cloth. Price, $5.50. Pp. 358, with 133 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1939.

This monograph is a model of authoritative statement on a subject in which the authors have had wide experience and therefore becomes an important contribution to the subject. While no particularly new points of view or methods are advanced, the authors have selected from the literature the most important contributions of English and American surgeons and have clearly depicted them and at the same time have elaborated their own experiences in an orderly and systematic manner. Splendid printing and illustrations on fine paper, easily readable tables, and thorough and detailed consideration of the many phases of the subject make the monograph invaluable to any surgeon interested in the subject. For the general medical man the monograph offers an opportunity to learn in an authoritative way the early symptoms, the diagnosis, procedures, the treatment and the prognosis of carcinoma of the rectum and colon. In view of the fact that about 40 per cent of deaths from cancer are due to cancer of the gastrointestinal tract and that 15 per cent are due to cancer of the bowel including the small intestine, it is obvious that this monograph covers a field that must appeal to every thoughtful medical man.

The chapter on operability and prognosis is an especially interesting one because in the first instance operability is often a matter depending on the experience and leanings of the individual surgeon and prognosis in turn depends much on operability and the careful estimation of the extent of the pathologic process. In this chapter, therefore, the reader is given a glimpse at the authors' judgment in selection of patients for operation and an estimation of the criteria which make for a long cure.

There are a few places in the monograph where exception to the views of the authors may be taken and in order not to make our praise of this work too florid, the relation of carcinomatous lymphatic involvement in prognosis can be mentioned; strictly speaking, lymphatic involvement is of most value in prognosis when the methods of determination and results of the study of lymphatic involvement are described. For instance, in the examination of removed specimens of cancer of the bowel for lymphatic involvement only twenty glands on an average can be removed and examined, contrasted to an average of from fifty to eighty glands which can be removed from the specimen after clearing it of blood and removal of the glands by means of transillumination. In the first instance, in which only twenty glands are examined, the involvement with cancer is about 45 per cent; when fifty or more glands are examined microscopically, the involvement is nearly 70 per cent. It is obvious that such a difference in the degree of involvement depending on the thoroughness of removal of the glands in a specimen will greatly modify the longevity figures which are based on lymphatic involvement.

The chapters on choice of operation, operative mortality and end results are excellent. The critical estimation of the results of others and the compilation of their own experience strike a high note in surgical writing.

Some of the high lights include the increasing tendency of experienced surgeons to remove cancer of the rectum by a one stage abdominoperineal procedure, the authors' abandonment of preoperative peritoneal vaccination, the value of resection of the left half of the colon by obstruction resection, and the five year survival figures in nearly 40 per cent of operable cases.

Were it possible to fill the racks of our medical libraries with medical monographs such as this one, the student of medicine would indeed be fortunate.

The Statistics of Pulmonary Tuberculosis in Denmark 1925-1934: A Statistical Investigation on the Occurrence of Pulmonary Tuberculosis in the Period 1925-1934, Worked out on the Basis of the Danish National Health Service File of Notified Cases and of Deaths. By Marie Lindhardt. Acta tuberculosea Scandinavica, Supplementum III. Paper. Pp. 179 with 17 illustrations. Copenhagen: Einar Munksgaard, 1939.

In this work attention is called to the fact that in 1896 the General Danish Medical Association requested the board of health to take steps to introduce obligatory notification of "pulmonary consumption" on physicians' weekly report lists and the inclusion of pulmonary consumption among the diseases for which free disinfection was obtainable. Because of certain objections on the part of the board of health it was not until April 1905 that Parliament passed two important tuberculosis laws, one of which dealt with the support of tuberculosis institutions by the state, and the other the Prevention of Tuberculosis Act, which provided for compulsory notification of cases of tuberculosis. Thus Denmark has had compulsory notification for all forms of pulmonary tuberculosis, with individual notification of every case and every death, continuously since 1905.

The present report is based on 41,704 notifications of fresh cases of pulmonary or laryngeal tuberculosis, in which there were 20,173 deaths. All of these deaths occurred in the ten year period 1925-1934. The cases are studied with reference to the various parts of the country from which they came and according to sex, age and occupation. Observations are also presented on the duration of cases that proved fatal.

It was pointed out that both morbidity and mortality are highest among females and that in both males and females the morbidity and mortality was highest in the age group of 20 to 24 years. For the entire country during the decade of 1925-1934, approximately one third of all deaths among males in the ages of 20 to 29 were due to pulmonary tuberculosis, whereas among females it was about one half between 20 and 24 years. Of all deaths in the decade, three fourths occurred on an average of eighteen months after notification for both sexes.

This volume contains numerous tables and curves, which are of great value to those interested in this particular phase of tuberculosis work. A valuable reference list is included.

The Health Insurance Doctor: His Rôle in Great Britain, Denmark and France. By Barbara N. Armstrong. Cloth. Price, $3. Pp. 264. Princeton, N. J.: Princeton University Press, 1939.

The blurb on the jacket says of the author "She was formerly executive secretary of the California Social Insurance Commission and for more than two decades has campaigned vigorously for health insurance." While this bias is evident in many places, no other book gives as detailed and accurate a survey of the British, Danish and French systems of sickness insurance.

The figures as to the percentage of physicians engaged in panel practice are a little hard to reconcile with those given in the "Report of British Health Services" by PEP (Political and Economic Planning). "The drugs capitation fee is uniform for all areas" and in 1936 this was set at 56 cents per head if all drugs were supplied. In view of the complaints of "excessive prescribing" this seems a very inadequate sum if really necessary drugs are supplied.

The statement is made repeatedly that physicians do not object in any of these systems to certification for inability to work, and there is considerable effort to show that certification causes but little conflict. The reader can draw his own conclusions from the description of the elaborate machinery that is maintained at least in Great Britain and France on the side of both the medical and the insurance carriers to hunt out abuses of certification. The conflicts in the French system between the insurance carriers and the physicians is emphasized, but little attention is given to the extent to which this is due to the participation, in spite of the law, of the carriers in the control of medical service or that this conflict is largely over certification for cash payments.

"For completeness of medical benefits," says the author, "Denmark with nearly fifty years of health insurance behind her stands out conspicuously in the three systems of health insurance review." That this superiority is due to the almost complete domination of the Danish system by the Danish medical association receives no emphasis, although the facts are accurately stated. Neither is there any stress laid on what

would seem to be a highly significant fact—that the Danish system is not really an insurance system since hospitalization, which is much more frequent than in most countries, is paid for largely by the state and local communities, which also pay much of the cost of insurance. Only members of the Danish Medical Association can engage in insurance practice, and the control of medical practice is almost entirely in the hands of the professional association. Moreover, no mention is made of the fact that during all but the last eight of the fifty years existence of the Danish system it was a voluntary system.

If the bias of the writer, which seems to be inseparable from all descriptions of sickness insurance, is kept in mind, this book is a valuable source of reference, especially on the details of organization, for any one interested in the subject of sickness insurance.

The Patient as a Person: A Study of the Social Aspects of Illness. By O. Cecil Robinson, M.D., LL.D., Sc.D., Lecturer in Medicine, Johns Hopkins University, Baltimore. Cloth. Price, $2. Pp. 422. New York: Commonwealth Fund; London: Oxford University Press, 1939.

This book should be carefully studied by general physicians and medical specialists of all fields. Written by an internist of great reputation, it adds new emphasis to the social aspect of illness. The author has studied in cooperation with social workers 174 patients suffering from a wide variety of diseases. He describes in succinct abstracts the illnesses and the environmental factors involved, so that the total picture of patient, disease and social factors are clearly visualized. The evidence is so well presented and the conclusions are so important for modern medicine that the volume could be made the text from which a special course might be taught in medical colleges. Concerning recent trends in governmental circles the following is quoted: "If the proper relationship of doctor and patient is retained through thick and thin, and the patient is given adequate consideration as a total individual, medical service will not suffer, no matter whatever the methods of organization, distribution and payment and whether or not the patient has a free choice of doctors beyond narrow limits. And it is the preservation of this relationship which new plans of medical service threaten that should be the keynote of the conservatism of the medical profession. If the medical profession is to give its best to the public which is now demanding changes in its medical service by legislation and government control, the so-called art of medicine must not be swept away by the waves of reform and of social reorganization. . . . The true physician must know his patient as an individual.

Fifty Years a Doctor. By John Knotter. Cloth. Price, $2. Pp. 247, with 15 illustrations. Boston: Meador Publishing Company, 1939.

Here are numerous incidents in the career of a physician who has practiced fifty years. He recounts the difficulties of getting started in practice in Chicago and notes that his office at one time was right next to that of Frank Billings and Herman Spalding, at the corner of Jackson and State streets, where the Hub clothing store is at present. He recounts his experiences in joining a group organized by his brother-in-law, a captain in the Chicago Fire Department, to go to the Klondike to seek gold in 1898. The book has little scientific or literary value.

Spezielle Symptomatologie und Diagnose innerer Erkrankungen in zwei Bänden. Von Professor Dr. Gottfried Boller, Vorstand der III. Medizinischen Abteilung im Allgemeinen Krankenhaus in Wien, und Dr. Robert Pfleger, Assistent der Abteilung. Mit einem röntgenologischen Anhang von Primararzt Docent Dr. Rudolf Papp. Bände I und II. Cloth. Price, 65 marks. Pp. 802; 803-1524, with 100 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1939.

This is another book on diagnosis in which the basis of the discussion is a symptom either subjective or objective in character. The whole subject of internal medicine is covered. The reader looks in the index for the symptom which is most prominent and is referred to the location in the text for a differential diagnosis of the subject in which he is interested. While the subject matter is fairly good, it is rather inadequate and needs further elaboration. The experience of the reviewer in trying to obtain information on several subjects does not lead him to believe that it has any more value than as a guide. For further information, other sources of information must be consulted. There are numerous illustrations and a good index, and it is well printed.

Les erreurs et les fautes en urologie: Étude critique, clinique et thérapeutique. Par L. Hinselmann, docent d'urologie à la Faculté de médecine de Bruxelles. Préface de M. le Prof. G. Marion. Paper. Price, 65 francs. Pp. 176. Paris: Masson & Cie, 1939.

In this monograph the author considers the errors which are not infrequently made in the diagnosis, prognosis and treatment of urogenital conditions. The introduction, written by Professor Marion, has as its main theme the fact that "we learn more through our errors than through our successes." The book is filled with urologic wisdom which only a man with a wide practical experience could have acquired. He warns against the indiscriminate routine use of the cystoscope because of the damage which can be caused by it. He reminds the reader that appendectomies have frequently been performed erroneously in cases in which treatment should have been given for ureteral and vesicular inflammation. The value of the book lies quite as much in its repetition of important errors which have been mentioned by other writers as in its presentation of new material. It emphasizes the things we have already learned and may forget and, in addition, it teaches valuable lessons that we should have known. The entire urogenital tract is systematically covered, beginning with renal disorders, proceeding to the ureters and bladder, and concluding with the genital organs. The book ends with a presentation of errors in radiology, which every surgeon and urologist should read because of its importance. The bibliography, while rather extensive, is limited to the works, mostly French, consulted by the author. A careful study of this valuable volume will help the reader to avoid many snares and pitfalls, with their occasionally unhappy consequences.

The Harvey Lectures Delivered under the Auspices of the Harvey Society of New York 1938-1939. Under the patronage of the New York Academy of Medicine. By Dr. Guy F. Marrian et al. Series XXXIV. Cloth. Price, $4. Pp. 279, with illustrations. Baltimore: Williams & Wilkins Company, 1939.

This volume contains the following lectures: Guy F. Marrian, University of Edinburgh, aspects of the intermediary metabolism of the steroid hormones; A. Ashley Weech, College of Physicians and Surgeons, New York, significance of the albumin fraction of serum; Eugene F. Du Bois, Cornell University Medical College, heat loss from the human body; Edwin J. Cohn, Harvard Medical School, proteins as chemical substances and as biologic components; Edwards A. Park, Johns Hopkins University, pathology of rickets with particular reference to the changes of the cartilage-shaft junctions of growing bones; K. Linderström-Lang, Carlsberg Laboratory, Copenhagen, distribution of enzymes in tissue and cells; C. H. Danforth, Stanford University, genic and hormonal factors in some biologic processes; Albert Szent-Györgyi, University of Szeged, biologic oxidation and vitamins.

Studien über experimentelle arthritiden und Hautödeme. Ein Beitrag zur Frage der pathogenetischen Bedeutung endokriner Faktoren bei den sogenannten Gelenkrheumatismen. Von Eric Jonsson. Acta medica Scandinavica, Supplementum C. Paper. Pp. 122, with 28 illustrations. Stockholm: Tryckeri A.-B. Häkenstad & Ernst, 1939.

This is a short monograph on the relationship between endocrine dysfunction and arthritis. The author presents a historical review of the literature on the endocrine and arthritis relationship, which he summarizes to the effect that the endocrine disturbance is either the only cause of the joint symptoms or a predisposing factor, or a coordinated one. Exclusive endocrine etiology is declined but the predisposing factor and the coordinated character are given the benefit of doubt from the review of the literature. The original work of the author is directed toward the solution of the question how far animal experiments will reveal the causal relation between endocrine disturbance and arthritic symptoms. The experiments of the author include serum and tuberculin injections, inoculation with streptococcus and polymorphodiplococcus, and foreign protein injections, applied to castrated animals as well as to controls. The conclusion of the author seems to be that the results indicate that endocrine influences exist in castrated animals; they have a part in the pathogenesis of certain forms of joint rheumatism, are not of dominant significance, and can be considered only as a predisposing factor. This seems to be all that is brought out in this rather short but well written and clearly presented monograph.

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Les calculs du Uretère. Par Pierre Mocquot. Préface du Professeur G. Potel. Paper. Price, 45 francs. Pp. 197, with 58 illustrations. Paris: Masson & Cie, 1940.

In this monograph the ureteral calculus is dealt with from the purely clinical point of view. The work is based primarily on the personal experience of the author, who for many years was assistant and chief of clinic under Prof. Gaston Potel. The latter has written a laudatory preface. Throughout the work emphasis is placed on the potential damage which the ureteral calculus can inflict on its associated kidney and the imperative need for its early removal from the urinary tract in order to prevent or minimize this damage. Jeanbrau, credited with having done the first important work on the ureteral calculus, is quoted as saying "The renal calculus often can wait; the ureteral calculus cannot wait." The author emphasizes this dictum throughout the work. Diagnosis and therapy occupy the major portion of the book. Little or no reference is made to the etiology of calculus or of the role which infection may assume. The illustrations are excellent and indicate well what they are intended to show. Twenty-seven cases of ureteral calculus are reported in detail. The work ends with an extensive bibliography covering the last thirty years.

The Management of Tuberculosis in General Hospitals: Pediatric Staff, Sanatorium. Prepared by William H. Ostway Jr., M.D., Assistant Professor of Medicine, University of Wisconsin Medical School, Madison, for the Council on Professional Practice of the American Hospital Association. Cloth. Price, $1. Pp. 78. Chicago, Illinois: American Hospital Association, [n. d.].

This work fills a long felt need, since there has not previously been available any outline of procedure for the management of tuberculous patients in general hospitals. Dr. Ostway was unable to find any hospital in the entire nation that has at present a complete tuberculosis program. The use of general hospitals for the isolation and treatment of tuberculosis has been recognized by a number of national and international medical and health organizations. As early as 1908 the International Congress on Tuberculosis, which met in Washington, D. C., urged the care of tuberculous patients in general hospitals. In 1912, and on a number of occasions since, the National Tuberculosis Association has made similar recommendations. The American Medical Association in conjunction with the United States Public Health Service in 1920 recommended the provision of wards in general hospitals for the care of tuberculous patients. The Canadian government has urged that hospitals receiving government aid hold available 10 per cent of their beds for tuberculous patients. Many physicians expert in the field of tuberculosis have strongly recommended the use of general hospitals for tuberculous patients, such as the late Dr. Lawrence Flick, of Philadelphia, who in 1895 arranged for such beds in general hospitals.

The author presents twelve reasons why general hospitals should admit tuberculous patients. He emphasizes the educational effects of having tuberculous patients in general hospitals for the medical staff, including interns and students, and also the nursing staff, including students.

He also calls attention to certain objections that have been offered to the hospitalization of tuberculous patients, but he states that there is apparently no logical reason for not admitting such patients, provided the danger of infection is controlled by thoroughly modern procedures. Dr. Ostway emphasizes the danger of infection to other patients and the entire personnel of the hospital and shows that for 120 years the high incidence of tuberculosis among nurses has been under discussion. He then proceeds to show how hospital personnel as well as other patients can be protected against exposure. It is strongly recommended that all members of the personnel of the hospital be adequately examined periodically for tuberculosis and that all patients admitted to any hospital be examined for tuberculosis in contagious form regardless of the condition for which the patient was admitted. When persons with contagious tuberculosis are found in the personnel or among the patients, a provision is recommended for them in which a technic is practiced in an attempt to control the spread of the disease. Thus the environment of the hospital is rendered free from contagious tuberculosis except in a small section set aside and equipped to manage such cases properly.

The last twenty pages of this book is devoted to an outline of a program for management of tuberculosis in a general hospital. This is prepared in such a manner that any one who reads it can find all the information necessary for setting up a tuberculosis service in a general hospital and managing the control of this disease throughout the entire institution. The author of this book, the American Hospital Association and especially the Council on Professional Practice are to be congratulated on publishing and distributing such a timely volume. An extensive list of references greatly enhances its value.

Psychiatrie: Ein Lehrbuch für Studierende und Ärzte. Von Prof. Dr. Kurt Kolle, Nervenarzt in Frankfurt a. Main. Paper. Price, 18 marks. Pp. 618, with 8 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1940.

This is just another compilation of clinical data labeled psychiatry by a practicing specialist for students and physicians. It is interesting that in this German volume published in 1939 there is a large section devoted to military questions. The book has no value.

The State and Medical Research. By Sir Edward Mellanby, K.C.B., M.D., F.R.C.P., Secretary, Medical Research Council. Harveian Oration, Royal College of Physicians, 18th October 1939. Cloth. Price, 2s. 6d. Pp. 32. Edinburgh & London: Oliver & Boyd, 1940.

The permission given William Harvey by Charles I to make use of deer and other animals in the royal parks for investigative purposes is held to be probably the first instance of state support of medical research. Support of research is discussed, particularly as illustrated by the Medical Research Council in England, which of late has been receiving an annual grant of £195,000 from the government. The organization and the activities of the council form the main part of the lecture, which will be read with interest by those who are concerned with administration of research.

Hormoner och Cancer: En Akut Antikarcinös och Antitoxisk Effekt av Östrogena Hormoner. By Yngve Patrick Hellström. Acta pathologica et microbiologica Scandinavica Supplementum XLI. Paper. Pp. 204, with 6 illustrations. Copenhagen: Einar Munksgaard, 1940.

The author has presented his experiments on the antineoplastic and antitoxic aspects of the estrogenic substances and on the sex variation in resistance to various poisons and anesthetics. He has concluded that estrogens protect the animal against these substances to a varying degree. Much of the material should be confirmed, since there are relatively few data in the literature on this subject. The practical importance of this work is still to be demonstrated.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Infection Following Childbirth Not Proof of Malpractice.—Sept. 2, 1935, one of the plaintiffs employed Dr. Clark, a member of a medical clinic, to attend his wife during confinement. Dr. Clark was called in an emergency, the patient's family physician not being available, and arrived a few minutes after the baby was born. He tied off, cut and bandaged the umbilical cord. He delivered the afterbirth and examined it in a general way. He cleansed the patient's external genitalia and caused sanitary pads and bandages to be prepared and used. He instructed the patient's mother to bathe the patient with a compound solution of cresol and water. On departing he gave no instructions other than a schedule for the baby's feedings and advice that the mother be given light food.

According to attendants, on September 3 and 4 a fever developed and a lump was noted in her side, but although Dr. Clark visited her on those days he made no examination, not even taking her temperature or pulse. Later she had pains in her side, headache and an offensive vaginal discharge. On the evening of September 4 the patient became worse and, in the absence of Dr. Clark from the city, another member of the medical clinic was called, but he did not visit her until the following morning. Then he did not take her temperature

with a thermometer, did not take her pulse and made no physical examination other than to examine her throat. He told her she might have scarlet fever and prescribed acetylsalicylic acid and quinine and advised warm soda water and alcohol baths. From September 5 to 10 the patient had a high temperature and an increasing pulse rate. Dr. Clark saw her on September 6 and 7 and ordered the quinine that had been prescribed by his associate discontinued, but he did not examine her.

On September 10 another physician was called, one apparently not connected with the medical clinic with which Dr. Clark was connected. He found that the patient had a temperature of 104 F. The next morning he made a vaginal examination and, according to the patient's mother, removed a piece of the afterbirth, about 3 inches (7.5 cm.) in length, 1½ inches (3.8 cm.) in width and ½ inch (1.3 cm.) in thickness, and also "a clot of something white." The patient's mother claimed that she observed a tear in the right side of the patient's vagina. The patient died September 12. The death certificate issued by the physician last in attendance gave as the cause of death "Child Birth followed by Septic Toxemia (Streptococcic)."

The husband and the children of the deceased woman brought suit for malpractice against the defendant physicians Dr. Clark and his associate in the medical clinic. From the judgment of the trial court directing a verdict in favor of the defendants, the plaintiffs appealed to the Supreme Court of Utah. In their complaint, the plaintiffs based their charge of negligence on the following facts: 1. Dr. Clark did not carefully examine the placenta and therefore failed to ascertain that a portion of it had not been expelled. 2. Dr. Clark failed to discover and treat an alleged laceration of the patient's vagina. 3. Dr. Clark and his associate member of the medical clinic failed to take the patient's temperature or pulse or to make any examination other than to examine her throat, and therefore failed to diagnose and treat her for the condition from which she was suffering. The evidence presented, however, said the Supreme Court, was not sufficient to require the submission of the case to the jury.

The testimony of the medical witnesses called by the plaintiffs contained little in support of their own charges but did support the defendants' defense. Two medical experts testified that a general examination of the placenta such as was made was a proper examination and was such as an average physician of reasonable care and skill in that community would have made. Another witness testified that a physician, even after a most careful examination of the placenta, might fail to discover that a portion of the afterbirth had not been expelled and that the defendants' treatment conformed to the practice of ordinary, careful and skilful physicians in the community. Women die from puerperal fever, an infection which may come either from the blood stream of the patient or from the outside, in spite of anything that the physician or nature can do. Patients with "septic toxemia, due to streptococci or otherwise," he testified, are treated symptomatically or expectantly by rest in bed, reduction of fever, general care and alleviation of symptoms. Alcohol baths and the administration of acetylsalicylic acid and quinine would, in his opinion, be good treatment.

The fact that there was an offensive vaginal discharge or lochia, it was testified, did not in and of itself indicate that there was anything wrong. In the absence of lacerations or tears of the birth canal visible from the outside, it would not be considered good practice in that community, this physician testified, unless the patient were in a hospital where aseptic conditions could be obtained, to explore the birth canal by instrumentation or otherwise to determine whether internal tears were present or whether any portion of the placenta remained in the uterus. Even if the patient were in a hospital it was generally accepted as good practice in that community to refrain from exploring the birth canal unless some unusual condition appeared, such as a severe hemorrhage. The danger of such exploration may be greater than that of leaving to nature the care of any internal condition which may exist. Failure to take the pulse and temperature and to examine the patient otherwise than was done might be consistent, according to medical testimony, with good practice in that community, or it might be bad practice, depending on the circumstances. The ordinary skilled and careful physician, it was testified, could determine the condition of his patient by observation without taking the temperature or pulse. The taking of the temperature or pulse did not constitute treatment, and failure to take either of them did not make the condition of the patient better or worse.

The doctrine of res ipsa loquitur, that the event speaks for itself, said the Supreme Court, has no application in this case. To recover damages, the plaintiffs had to show that the cause of the injuries complained of was the failure of the defendant physicians to exercise such care and diligence as was ordinarily exercised by skilled physicians in the same field of medicine in that vicinity. The court was unable to find anything which the defendant physicians had done that the evidence showed they should not have done or failed to do anything that the evidence showed they should have done. The expert medical testimony showed that the practice of the defendant physicians and the treatment prescribed by them was in conformity with that of the ordinary skilful physician in the community. Neither the testimony of lay witnesses nor that of expert medical witnesses pointed to any act of commission or omission on the part of the defendants that was the proximate cause of the patient's death. Although the testimony of the patient's father, mother and husband might have given rise to an inference that all was not done that in their minds they believed should have been done, the testimony that they gave did not indicate just what it was that they had in mind that should have been done.

In the opinion of the Supreme Court of Utah, the trial court properly refused to submit the cause to the jury, because to do so would improperly set the jury to conjecturing, surmising or guessing at the possibilities as to what should or should not have been done. Accordingly the court affirmed the judgment directing a verdict in favor of the defendant physicians.

One of the justices, however, Justice Wolfe, in concurring in the decision of the court, added the following interesting commentary:

> I do not think that the rule that the testimony of a witness is no stronger than is shown by the cross examination applies in the case where cross and direct examination are practically reversed. Where it becomes apparent that a witness, while not hostile, is very reluctant to testify against a friend or one of his own profession, or is desirous of aiding him as far as possible by "going easy," or makes his answers all comport with a protective motive in the realm where opinions might differ, or gives him every benefit of the doubt in testifying that such conduct "might be good practice" or testifies with apparent mental reservations and simply awaits the cross examination to emphasize this protective motive, I do not see that the rule applies.
>
> "It is not the duty or right of this court to appraise the evidence except to determine whether there is any substantial evidence to support the verdict or findings. If the opinions of the doctors who testified, as to the defendants' conduct that it was in conformity with the usual skilful practice under the conditions of this case in their community, appear to the layman to put that practice in that community on too low a level, the judicial finding of that fact must rest with the jury and not with this court. If the opinion means to hold by implication or otherwise that all negligence based on conduct of a doctor in an obstetric case must be proved by expert medical testimony, I do not agree.

—Edwards v. Clark (Utah), 83 P. (2d) 1021.

Society Proceedings

COMING MEETINGS

American Academy of Orthopedic Surgeons, Boston, Jan. 21-25. Dr. Carl E. Badgley, 1313 East Ann St., Ann Arbor, Mich., Secretary.

American Orthopsychiatric Association, Boston, Feb. 22-24. Dr. Norvelle C. La Mar, 149 East 73d St., New York, Secretary.

Annual Congress on Industrial Health, Chicago, Jan. 15-16. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, Feb. 12-13. Dr. W. D. Cutter, 535 North Dearborn St., Chicago, Secretary.

Eastern Section, American Laryngological, Rhinological and Otological Society, Pittsburgh, Jan. 5. Dr. John R. Simpson, Medical Arts Bldg., Pittsburgh, Chairman.

Middle Section, American Laryngological, Rhinological and Otological Society, Kansas City, Mo., Jan. 19. Dr. Sam E. Roberts, Professional Bldg., Kansas City, Mo., Chairman.

Society of Surgeons of New Jersey, Camden, Jan. 31. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.

Southern Section, American Laryngological, Rhinological and Otological Society, Columbia, S. C., Jan. 8-9. Dr. Walter J. Bristow, Doctors Bldg., Columbia, S. C., Chairman.

Western Section, American Laryngological, Rhinological and Otological Society, Los Angeles, Jan. 26-27. Dr. Pierre Viole, 1930 Wilshire Blvd., Los Angeles, Chairman.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

9: 141-168 (Nov.) 1939

Clinical Aspects of Thyroid Disease. A. Taylor, Clifton Springs, N. Y. —p. 141.

The Enema: Its Uses and Abuses. C. D. Gaston and H. B. Williams, Birmingham.—p. 143.

Habitual Use of Alcohol in Alabama. W. D. Partlow, Tuscaloosa.—p. 145.

Acute Gastrointestinal Intoxication: Management in Infancy and Childhood. J. H. Baumhauer, Mobile.—p. 148.

Atabrine as Malarial Prophylactic Agent: Experiments in Alabama. D. G. Gill, Montgomery, and M. Smith, Tuskegee.—p. 151.

American J. Obstetrics and Gynecology, St. Louis

38: 557-742 (Oct.) 1939. Partial Index

Metabolism and Utilization of Progesterone Given Intramuscularly to Women. E. C. Hamblen, N. B. Powell and W. K. Cuyler, Durham, N. C.—p. 557.

Toxemia Mortality in the Southern States: Critical Study of 577 Maternal Deaths in North Carolina. W. Z. Bradford, Charlotte, N. C.—p. 574.

*Relationship of Time of Ligation of Cord to Red Blood Count of Infant. H. B. Frischkorn and M. P. Rucker, Richmond, Va.—p. 592.

Current Views on Causation of Menstruation. E. T. Engle, New York. —p. 600.

Effect of Ingested Estrone (Progynon DH) and Parenterally Administered Synthetic Progestin (Proluton) on Human Castrate Uterus. T. Neustaedter, New York.—p. 609.

Anterior Pituitary-like Hormone in Late Pregnancy Toxemia: Summary of Results Since 1932. G. Van S. Smith and O. W. Smith, Brookline, Mass.—p. 618.

Effect of Crystalline Corpus Luteum Hormone, Progesterone, on Ovaries and Related Endocrine Organs. C. Mazer and S. L. Israel, Philadelphia.—p. 625.

Effect of Pregnancy on Gastric Secretion. J. S. Lahate, New York.—p. 650.

*Prolapse of Uterus, Hydronephrosis, Hypertension: Probable Sequence of Events. P. H. Wosika and C. C. Maher, Chicago.—p. 684.

Granulosa Cell Neoplasm with Discussion of Possible Histogenesis. M. B. Dockerty and W. C. MacCarty Sr., Rochester, Minn.—p. 698.

*Suburethral Abscesses, Urine Pockets and Diverticula in Female Urethra: Report of Eight Cases. H. E. Schmitz and P. A. Nelson, Chicago.—p. 707.

Practical Treatment of Gonorrheal Endocervicitis. K. P. A. Taylor, Puerto Armuelles, Panama, Canal Zone.—p. 712.

Improved Method for Applying Pelvic Heat Using Air. L. B. Newman, Chicago.—p. 725.

Ligation of Cord and Erythrocyte Count of Infant.—In determining the relation of the erythrocyte count of the newborn and the time at which the cord is ligated, Frischkorn and Rucker at varying intervals tied the cords of more than 400 unselected infants. All the patients were white and all had sodium amytal-scopolamine analgesia and ether anesthesia. The cord continued to pulsate longer than in Budin's series, in which probably no anesthesia was used. In one instance pulsations continued for fifty minutes. The amount of blood that drained out of the placental end of the cord was measured. A blood count was made by the hospital technician within twenty-four to thirty-six hours. In fifty-nine cases in which the cord had ceased to pulsate before it was tied the infant's erythrocyte count averaged 5,783,400, whereas in 333 cases in which the cord was pulsating when tied the count averaged 5,198,919, a difference of 584,481. There was practically no correlation between the number of minutes that elapse before the cord is ligated and the erythrocyte count of the infant. The length of time before tying the cord had no influence on the amount of blood left in the umbilical vessels. On the other hand there is a significant negative correlation between the amount of blood that is left in the umbilical vessels and the number of erythrocytes in the infant's circulation. Those infants whose cords were allowed to stop pulsating before they were ligated had higher erythrocyte counts. This is significant enough to justify waiting until the cord ceases to pulsate and the umbilical vessels collapse, especially in small and premature infants.

Prolapse of Uterus, Hydronephrosis, Hypertension.—Wosika and Maher studied the relationship between the urinary tract and hypertension in fifteen cases of prolapse of the uterus encountered in private cardiac practice. Urologically, the patients presented variable x-ray changes by retrograde catheterization and intravenous urograms, from normal conditions to massive dilatation of the ureters and renal pelves. Urethral and bladder irritation were invariably constant with evidence of infection, usually with Bacillus coli and staphylococci. From the cardiovascular standpoint, hypertension was present consistently with varying levels in all cases with the possible exception of one of extreme uremia and shock due to the incarceration. Evidence of left ventricular enlargement was present in from mild to extreme degrees, as shown by *2* meter roentgenograms. The electrocardiogram showed left axis deviation to be present in ten cases and normal axis deviation in five. Cardiac complications included congestive heart failure, coronary sclerosis and cerebral thrombosis. An associated study of the incidence of hypertension in a somewhat larger series of patients with prolapse was made possible through the records of the first eighty-four patients with prolapse entering the Passavant Memorial Hospital. Hypertension was found to be present in sixty-one of the eighty-four cases. The frequency of hypertension in these cases would indicate strongly that the occurrence of increased blood pressure and prolapse cannot be explained solely on a basis of coincidence. Factors commonly associated with increased blood pressure such as age, heredity and chronic nephritis were considered. The urinary observations were not characteristic of chronic glomerulonephritis, although transient albuminuria and casts were found in those patients who were observed over a period of years. The urologic evidence pointed to the infectious and obstructive character of the renal lesion rather than to a true glomerulonephritis. It was impossible to obtain evidence which either proved or disproved the hereditary factor. The damage to the urinary tract was found to be varying degrees of hydronephrosis and hydro-ureter, with recurrent infection. While the exact mechanism of ureteral compression does not seem to be entirely clear, obstruction is consistent with complete prolapse. While obstruction of the ureters was established readily with the complete prolapse, not all patients could be proved as having a resultant hydronephrosis and hydro-ureter by present day criteria. Generally, patients having prolapse of short duration had minimal urologic changes, while greater deformity was present when the procidentia existed for an extended period of time. Theoretically, it is possible for urinary obstruction, regardless of the cause, to produce hypertension. The role of obstruction in the production of hydronephrosis has been established. The role of infection also must be considered as a factor. The diagnosis of essential hypertension or hypertension of unknown origin is not justifiable unless all defects of the urinary tract are excluded. It seems that a perfect mechanism exists for the production of hypertension in patients with prolapse of the uterus, when the obstruction in the urinary tract produces hydronephrosis. The enlargement of the pelvis of the kidney encroaches on the blood supply. The partial ischemia that results produces systemic hypertension by an unexplained mechanism.

Abscesses and Diverticula in Female Urethra.—Schmitz and Nelson state that diverticulum of the female urethra, once considered rare, is now a not unusual diagnosis after careful gynecologic or urologic examination. More than 100 cases have been reported, and additions are rapidly being made. The authors cite eight cases. They are not to be confused with abscesses or cysts of Skene's glands, vaginal cysts or small vaginal myomas. Urethral diverticula may be classified either as true or as false. When all the layers of the urethra are involved in the process, they are called true diverticula. False diverticula are those in which only the submucosa and mucosa protrude, the muscularis having ruptured. Structural weakness, trauma and infection are important etiologic factors in acquired diverticula. Congenital diverticula are disputed. Treatment should be surgical extirpation. Suprapubic cystotomy is usually unnecessary. Use of the electrocautery is dangerous and may lead to poor end results.

American Journal of Physiology, Baltimore

127: 605-806 (Nov.) 1939. Partial Index

Effect of Faradic and Galvanic Stimulation on Course of Atrophy in Denervated Skeletal Muscles. E. Fischer, Richmond, Va.—p. 605.
Qualitative Study of Normal Gonadotropin. F. E. D'Amour, Denver.—p. 649.
Origin of Respiratory Rhythmicity. R. F. Pitts, H. W. Magoun and S. W. Ranson, Chicago.—p. 654.
Selective Vascular Reaction Patterns in Nasal Septum and Skin of Extremities and Head. A. B. Hertzman and J. B. Dillon, St. Louis.—p. 671.
Glucose and Lactic Acid Exchanges During Hypoglycemia. H. E. Himwich, J. F. Fazekas and Sarah Nesin, Albany, N. Y.—p. 685.
Effect of Ingestion of Glycine, With and Without Urea, on Creatine-Creatinine Excretion in Rat and Man. H. H. Beard, Julia K. Espenan and P. Pizzolato, New Orleans.—p. 716.
Relation of Blood Pressure and Concentration in Serum of Potassium, Calcium and Magnesium. H. E. Hoff, P. K. Smith and A. W. Winkler, New Haven, Conn.—p. 722.
Diodrast Clearance and Renal Blood Flow in Normal Pregnant and Nonpregnant Women. L. C. Chesley and Elizabeth R. Chesley, Jersey City, N. J.—p. 731.
Ketone Body-Total Carbohydrate Utilization Ratios and Their Relation to the Problem of Ketosis. J. A. Dye and Jane L. Chidsey, Ithaca, N. Y.—p. 745.
Venous Return as Factor Affecting Vital Capacity. P. Dow, Augusta, Ga.—p. 793.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

42: 481-636 (Oct.) 1939. Partial Index

Examination of Larynx and Adjacent Structures with Intrapharyngeal Films. A. Hartung and J. W. Grossman, Chicago.—p. 481.
Intra-Oral Minor Salivary Gland Adenocarcinoma. J. E. Wirth, Seattle.—p. 508.
Aspiration Biopsy of Tumors in Obscure or Difficult Locations Under Roentgenoscopic Guidance. J. V. Blady, New York.—p. 515.
*Removal of Lipiodol After Myelography. H. V. Briesen, Los Angeles.—p. 523.
Roentgen Treatment of Primary Inoperable Carcinoma of Breast. J. A. L. McCullough, E. T. Leddy and A. U. Desjardins, Rochester, Minn.—p. 534.
Irradiation Keratoses and Carcinoma. J. J. Duffy, New York.—p. 540.
Radium Treatment of Peyronie's Disease. R. E. Fricke and J. W. Olds, Rochester, Minn.—p. 545.
Roentgen Therapy of Cystic Hygroma of Neck in Children. F. M. Hodges, L. O. Snead and R. A. Berger, Richmond, Va.—p. 551.
Low Voltage Lightly Filtered Roentgen Radiation versus Radium and High Voltage Roentgen Radiation in Treatment of Superficial Cancer. L. R. Cowan, Salt Lake City.—p. 556.
Treatment of Encephalitis with Roentgen Ray: Preliminary Report. S. Rubenfeld and A. Wolf, New York.—p. 561.
Clinical Symptoms Useful as Guide for Roentgen Therapy. W. L. Ross, Omaha.—p. 565.
Rhythm of Radiation Effects: Further Studies of Protracted External Irradiation in Treatment of Neoplasms of Upper Respiratory Tract. M. Friedman and Rieva Rosh, New York.—p. 572.

Removal of Iodized Oil After Myelography.—Briesen believes that the procedure which he used for removing iodized oil after myelography dispenses with one of the major objections to performing myelography. After x-ray examination was done and the roentgenograms were developed his patient was taken to the operating room in a sitting position. With the area under local anesthesia an incision was made over the upper spines of the sacrum, the intraspinous ligament was removed, a drill hole of one-eighth inch was placed in the sacrum and a trocar was inserted. No material would flow through the trocar, but when the trocar was removed the oily material flowed slowly, like cold syrup. Nothing seemed to hurry it. However, by means of a small probe and by allowing the material to run over the wound and into a cup, it was kept flowing until spinal fluid was obtained. The spinal fluid was allowed to run until there appeared to be no more globules of oil in it. The wound was then closed in a routine manner. The length of time that it took for the iodized oil to run out was approximately one hour, and consequently the patient suffered considerable pain and discomfort, as he was sitting up all this time. His recovery from this procedure was uneventful, and roentgenograms taken several days later showed at least a 90 per cent removal of the iodized oil. The author states that on inquiry as to the complete removal of the oil Adson suggested: "Have the patient sit upright in a chair for an hour before proceeding with its removal in order that all the lipiodol will be concentrated in the caudal sac. The operating table is then adjusted so that the head of the table is much higher than the foot, after which the patient is placed on his abdomen with the feet resting against the foot piece and the hands strapped along the side. In such a position, the lipiodol is constantly kept in the caudal sac."

Archives of Ophthalmology, Chicago

22: 727-946 (Nov.) 1939

*Local Use of Vitamin A Preparations in Ophthalmic Practice. S. de Grósz, Budapest, Hungary.—p. 727.
*Treatment of Tuberculosis of Anterior Portion of Eye with Beta Rays of Radium. A. C. Woods, Baltimore.—p. 735.
Hyperphoria Tests Based on New Principle. F. H. Verhoeff, Boston.—p. 743.
Plexiform Neurofibromatosis (Recklinghausen's Disease) of Orbit and Globe, with Associated Glioma of Optic Nerve and Brain: Report of Case. F. A. Davis, Madison, Wis.—p. 761.
Slit Lamp Observations During Experimental Intracapsular Extraction of Cataract. J. Goldsmith, New York.—p. 792.
*Bilateral Detachment of Retina: Heredodegenerative Disease. A. de Rötth, Spokane, Wash.—p. 809.
Betts Visual Sensation and Perception Tests: Method of Detecting School Children Requiring Ocular Attention. Lura Oak and A. E. Sloane, Boston.—p. 832.
Extraction of Subluxated Lens by Lever Action Intracapsular Method. K. C. Dutt, Sompur Raj, India.—p. 844.
Ocular Reactions to Diphtheroid Bacilli. H. Lucic, Baltimore.—p. 849.
Detecting, Measuring, Plotting and Interpreting Ocular Deviations. W. B. Lancaster, Boston.—p. 867.

Local Vitamin A for Ocular Disorders.—The local application of vitamin A in the treatment of injuries to and trophic conditions of the cornea is outlined by de Grósz. The vitamin A preparation is called vulnovitan (an oil or an ointment with petrolatum base) and 1 cc. of the oil contains 1,000 international units of vitamin A. As far as injuries are concerned, this therapy is extremely useful in promoting epithelization of fresh corneal lesions (as in erosions after extraction of foreign bodies) and it has a powerful analgesic effect, though it does not surpass ethylmorphine hydrochloride. The eye is bandaged. For injuries of the eyelid for which sutures are not necessary, the ointment (1 Gm. contains 500 international units of vitamin A) is used. Other conditions for which the ointment is indicated are torpid ulcerous and scrofulous blepharitis, though for the former a better reaction is obtained with roentgen irradiation. Though one cannot expect the anti-infectious factor of vitamin A to have a disinfecting action since it is not bactericidal, there is a rise of local resistance. However, if infection is feared or if signs of infection are already present, disinfecting agents should be used and foreign protein (milk) injected or sulfamilamide given. The vitamin A preparation has a good effect on injuries and burns of the conjunctiva, for after thorough rinsing of the culdesac its application prevents the formation of adhesions by hastening epithelization of the conjunctiva. The author has used vulnovitan (oil) for the treatment of caustic burns caused by lime and sodium hydroxide and also for injuries caused by indelible pencil, the eye first being rinsed with a 1 per cent solution of hydrogen peroxide. He states that vulnovitan is absolutely indicated for injuries due to gases used in industry and in warfare because of its analgesic and lubricating effect. Some of the other conditions in which he found vulnovitan to be beneficial are corneal inflammation, torpid ulcers, recurrent erosion, bullous keratitis, neuroparalytic keratitis, Fuchs's epithelial dystrophy, filamentous keratitis, corneal degeneration of obscure etiology, acute photo-ophthalmia, superficial punctate keratitis, radium necrosis of the cornea, keratitis due to mustard gas and trachomatous pannus. There is no indication for vitamin A therapy for acute or chronic catarrh, scleritis or deep keratitis. Local application of vitamin A not only helps but accelerates epithelization; it is truly a protective agent for the epithelium. The rise of the resistance is only a secondary phenomenon. To eliminate tolerance, overdosage must be avoided. Vitamin A in oil should be purchased in small amounts (ampules) because, owing to its unstableness, it readily loses its effectiveness as the result of oxidation, once the container is opened. The excipient itself also has adhesive and protective characteristics. The use of ethylmorphine hydrochloride is not superfluous when one is applying vitamin A. The vitamin A is applied from three to five times a day and can be used with or without a bandage; a supplementary treatment can be given also. Heat in the form of short wave irradiation and infra-red irradiation should be given to aid resorption of vitamin A.

Beta Rays of Radium for Ocular Tuberculosis.—Woods used the beta rays of radium for the treatment of ten patients with tuberculous kerato-iritis and of three with deep tuberculous scleritis. There was prompt subsidence of all inflammation after one course of treatment, although two of the patients

with tuberculous keratitis had recurrences. These were again controlled by further irradiation. Deep scleritis was more resistant, steady treatment over a greater period of time being required before any decided improvement occurred. One patient showed improvement and final healing of the scleritis after steady treatment for eight months. The second patient, who was blind in one eye because of an atrophic choroiditis, had a marked scleral ectasia at the site of the scleritis. Under repeated courses of beta irradiation, extending over two years, there was definite and steady improvement with almost complete subsidence of the ectasia. This patient had been under observation for the preceding five years and had grown steadily worse in spite of all local and general treatment, including repeated paracentesis and tuberculin therapy. The third patient showed temporary improvement after only one course of treatment but had a relapse on returning to her home in a distant state.

Bilateral Detachment of Retina.—According to de Rötth, from January 1930 to June 30, 1938, there were 270 patients treated for retinal detachment at the State Eye Hospital in Budapest. Only a few of them have not been subjected to operation. Of thirty-three, or 12.2 per cent, the detachment was bilateral; twenty-three were men and ten women. The average age of patients when detachment developed in the first eye was 39 years and in the fellow eye 44. Forty-two per cent of the patients were young persons up to 30 years of age. Every type of retinal hole was observed, but each eye always showed the same type of hole as its fellow. In addition to the type being the same, the holes occurred mostly at a symmetrical part of the retina. The occurrence of binocular detachment, especially its uniformity in the two eyes, supports the view of Vogt concerning the pathogenesis of this disease, that disposition to develop a hole is a consequence of presenile and senile degeneration of the retina, vitreous, choroid and vessels. The disposition is a congenital property of the germ plasm. The author goes further and considers one group of binocular detachments as a primary heredodegenerative disease which does not depend on senility. The probability of heredodegeneration is supported by the occurrence of familial detachment in two brothers and a sister. The disease seems to be caused by abiotrophy—heredodegeneration of the retina, as in systemic degeneration of the nervous system. The retina as a portion of the central nervous system may also have a predisposition to degeneration lying in the genotype. The horseshoe-shaped or lobular holes are almost always combined with myopia and with degeneration of the vitreous. In these cases the mechanical effect, pulling by the vitreous, may also be a factor aside from the degeneration of the retina. In the small degenerative round holes a vascular degeneration is mostly present, i. e. a condition due to trophic disturbance; according to Vogt's theory, primary damage occurs in the vessels, not in the retina as is supposed in the other biotypes. The single biotypes do not transform into one another; each begins in its typical form.

Archives of Otolaryngology, Chicago

30: 689-862 (Nov.) 1939

Experiences with Fistulization of Labyrinth in Chronic Progressive Deafness: Report of Cases. E. H. Campbell, Philadelphia.—p. 689.
End Results of Intranasal Operation for Maxillary Sinusitis. B. E. Hempstead, Rochester, Minn.—p. 711.
End Results of Intranasal Operations on Ethmoid, Frontal and Sphenoid Sinuses. E. R. Faulkner, New York.—p. 716.
End Results of External Operations on Maxillary Sinus. S. Salinger, Chicago.—p. 721.
End Results of External Operations on Frontal, Ethmoid and Sphenoid Sinuses. M. F. Arbuckle, St. Louis.—p. 736.
Atresia of External Auditory Meatus: Canalization by Electrocoagulation. J. N. Novick, Washington, D. C.—p. 744.
*Short Wave Diathermy in Treatment of Nasal Sinusitis. A. R. Hollender, Miami Beach, Fla.—p. 749.
Treatment of Acute Suppurative Otitis Media: Does Douching of Ear Spread Infection to Mastoid Cells? O. C. Hirst, Philadelphia.—p. 755.
Benign Cysts and Adamantinomas of Jaws. F. Z. Havens, Rochester, Minn.—p. 762.
**"Functional" Loss of Hearing Following Injuries to Head. M. Rosenthal, New York.—p. 775.
Purulent Otitis Media, Mastoiditis, Sinus Thrombosis and Suppuration of Petrous Pyramid. S. J. Kopetzky, New York.—p. 800.

Short Wave Diathermy for Sinusitis.—With a view to correct evaluation of short wave diathermy in the treatment of disease of the nasal sinuses, Hollender repeated the temperature studies of Andreen and Osborne and of Rosenwasser and Bierman. In twenty cases of acute exacerbation of maxillary sinusitis in which the taking of temperatures through a window was feasible, the following results were obtained: In ten there was an elevation of temperature ranging from 0.6 to 1.5 degrees F., in four there was no gain or loss and in the remaining six there were losses ranging from 0.4 to 1 degree F. The treatments were given with air-spaced electrodes over the affected antrum for periods of fifteen minutes, and in all cases the same apparatus was employed. In a second series of eighteen cases of acute maxillary sinusitis, short wave diathermy (from a 6 meter apparatus) was applied without resort to any other treatment. In a control group orthodox procedures were employed without short wave diathermy, and in a third group short wave treatment was added to accepted routine measures. In the first group, after four days, six of the patients had to be given relief by irrigation, shrinkage and suction. The most unfavorable result was obtained in the group treated by short wave diathermy alone. The most favorable response was obtained in the third group, in which short wave treatment was combined with routine treatment of the sinuses. In a third series of fourteen selected cases of chronic maxillary sinusitis (inflammatory and suppurative but not definitely hyperplastic), in which there had previously been numerous nonsurgical methods of treatment, diathermy was tried over a period of a year to evaluate its effectiveness. Seven of the patients were treated with diathermy alone and seven had the benefit also of intranasal and constitutional remedies. Of the first seven patients only one showed moderate improvement; in the other group of seven, two showed a decided favorable change and only one slight improvement.

Head Injuries and Loss of Hearing.—In defining functional loss of hearing from an industrial angle, Rosenthal assumes that ordinary conversation is carried on within the frequencies 256, 512, 1,024 and 2,048 double vibrations. He bases his deduction on the loss in decibels for these frequencies and calls it functional loss. Of nineteen patients examined after head injuries within a day or two after admission to Gouverneur Hospital or as soon as they became oriented, functional loss of hearing ensued in two. The trauma most often occurred in the basal coil of the cochlea with impairment for perception of the higher frequencies, above 2,048 double vibrations, which does not by itself produce "functional" loss of hearing. Concussion was diagnosed by the neurologist in all nineteen cases, unconsciousness was observed in fifteen, fracture of the skull was shown roentgenographically in five, and the complaint of vertigo (nausea, vomiting and dizziness) was made in six. Loss of hearing for the higher frequencies was diagnosed in nine, in three of which it was bilateral. In the two cases in which there was loss of hearing within the "functional" range, the loss was unilateral.

Arkansas Medical Society Journal, Fort Smith

36: 123-148 (Nov.) 1939

Postoperative Care of Average Patient Following Abdominal Operation. G. V. Lewis, Little Rock.—p. 123.
Treatment of Chronic Empyema in Children. H. Shipp, Little Rock.—p. 126.
Your State Hospital. N. T. Hollis, Little Rock.—p. 128.

Journal of Experimental Medicine, New York

70: 443-542 (Nov.) 1939

*Radioactive Iron and Its Excretion in Urine, Bile and Feces. P. F. Hahn; W. F. Bale; R. A. Hettig, Rochester, N. Y.; M. D. Kamen, and G. H. Whipple, Rochester, N. Y.—p. 443.
Experimental Production of Digestive Tract Ulcerations. A. Penner and Alice Ida Bernheim, New York.—p. 453.
Method for Study of Induced Interference with Transplantable Tissue Growth. D. A. MacFadyen and J. B. Murphy, New York.—p. 461.
Inhibition of Transplantable Mouse Tumor Growth by Tissue Extracts and Their Protein Fractions. D. A. MacFadyen, E. Sturm and J. B. Murphy, New York.—p. 475.
Experimental Meningococcic Infection of Chick Embryo. G. J. Buddingh and Alice D. Polk, Nashville, Tenn.—p. 485.
Pathogenesis of Meningococcic Meningitis in Chick Embryo. G. J. Buddingh and Alice D. Polk, Nashville, Tenn.—p. 499.
Study of Passive Immunity to Meningococcic Infection in Chick Embryo. G. J. Buddingh and Alice D. Polk, Nashville, Tenn.—p. 511.
Nature of Pressor Action of Renin. I. H. Page, Indianapolis.—p. 521.

Excretion of Radioactive Iron.—Hahn and his collaborators studied the iron excreted in the urine, bile and feces of dogs given radioactive iron as ferrous gluconate by vein. In summary they state that there is an initial extra output of iron in the urine and feces for a few days (from three to fifteen) after its injection, and this may total from 2 to 8 per cent of

the injected iron. Following this initial reaction the urinary excretion of radioactive iron drops to traces or even to zero. The feces always contain measurable amounts; in five dogs receiving from 100 to 250 mg. the daily fecal excretion settled down to from 0.05 to 0.4 mg. Blood destruction (acetyl phenylhydrazine) caused a definite increase in radioactive iron eliminated daily in the feces (from 0.1 to 1 mg.). Probably most of this excess of iron came through the biliary tract (bile fistula). The bile under usual conditions contributed but little iron to the intestine (0.01 mg. or less of radioactive iron daily). The body controls its iron stores by absorption or lack of it rather than by the capacity to eliminate it. The evidence is overwhelming that the dog excretes iron with difficulty and in small amounts (even in the plethoric state) by means of the biliary and gastrointestinal tracts.

Journal Industrial Hygiene & Toxicology, Baltimore

21: 321-438 (Oct.) 1939

*Chronic Exposure to Benzene (Benzol): I. Industrial Aspects. M. Bowditch and H. B. Elkins, Boston.—p. 321.
*Id.: II. Clinical Effects. F. T. Hunter, Boston.—p. 331.
Id.: III. Pathologic Results. T. B. Mallory, E. A. Gall and W. J. Brickley, Boston.—p. 355.
Benzene (Benzol) Poisoning in Rotogravure Printing Industry in New York City. L. Greenburg, May R. Mayers, L. Goldwater and Adelaide R. Smith, New York.—p. 395.
Hematologic Effects of Benzene (Benzol) Poisoning. L. A. Erf and C. P. Rhoads, New York.—p. 421.

Industrial Aspects of Chronic Exposure to Benzene.—Bowditch and Elkins discuss the industrial aspects of continued exposure of workers to benzene (benzol) in several artificial leather plants. Eighty-five workers were examined. There were thirteen serious cases of benzene poisoning, with recovery in only two. The authors made thirty-six urine sulfate ratio determinations and a total of eighty-four atmospheric air analyses. Benzene vapor determinations were made chiefly by the volumetric method developed by Smyth. These tests were made in plants in which relatively good control was maintained. The benzene exposure was as a rule obtained by averaging the results of all vapor determinations made in the given worker's area. These urine samples were taken near the end of the working day, after at least six hours of exposure. The time of day at which the sample is taken is very important, as in every case except that of one worker the ratio of the afternoon sample was more than 20 per cent lower than that of the forenoon sample. The principal two processes involving benzene exposure are the mixing of a nitrocellulose dope, carried out in the compounding room, and the coating of fabric therewith, done in the coating room. There have been eight known recent cases of benzene poisoning terminating fatally in three artificial leather plants. In these plants there were, in all, about sixty workers exposed to benzene vapor in concentrations ranging from 100 to more than 200 parts per million. The compounding room is their chief source of exposure. In three other plants of this type in which the maximal average exposure was judged to be 100 or less parts per million there have been no fatalities. Two plants using benzene rubber cements in the manufacture of crape rubber soles for shoes showed naphtha vapor concentrations of from 300 to 1,300 parts per million. The poisoning cases in these plants, involving women, occurred after relatively short exposures to apparently high concentrations of benzene vapor. In the artificial leather establishments, on the other hand, the exposures have in all cases been longer and, as a rule, less severe. From determinations of atmospheric benzene concentrations in the various shops the data show that the commonly accepted maximal allowable concentration for benzene vapor is 100 parts per million, although Greenburg reported a definite hazard in even lower concentrations. On the other hand, 50 per cent has been proposed as the limiting safe value for the urine sulfate ratio. These two standards are not correlative. A 50 per cent urine sulfate ratio, based on a single sample taken at the end of the working day, would probably correspond to an average benzene vapor concentration of slightly below 75 parts per million. This value has been proposed as the maximal allowable concentration by the Massachusetts Dust and Fume Code Committee and, in the light of their experience, seems to the authors not unduly restrictive. While they have found that benzene vapor concentrations may readily be kept below 75 parts per million in the majority of industrial processes involving its use, this is not true of all such operations. The fatal outcome to two workers who the authors believe were exposed to average concentrations well below 75 parts per million indicates the possibility of occasional cases of benzene poisoning with even the best of control. Close medical supervision of all benzene workers is thus most important and it is to be hoped that adequate substitute materials will be developed for the more hazardous industrial uses of this excellent solvent.

Clinical Effects of Chronic Exposure to Benzene.—The clinical effects on eighty-nine individuals exposed to various concentrations of benzene fumes were studied by Hunter, who gathered the material during the last four years. His study included the history, physical examination, routine urine and serologic tests and complete laboratory tests of the blood of each person. In addition, in several instances gastric analyses, cell volume and sedimentation rate determinations were carried out. Furthermore, a diagnostic biopsy of the sternal marrow was performed on certain patients, and in eight of the ten fatal cases a postmortem examination was made. Depending on the degree and duration of exposure, an analysis of the blood indicates that benzene may bring about polycythemia or anemia, leukocytosis or leukopenia, leukemia or leukemoid blood pictures (either lymphatic or myeloid), eosinophilia, megalocytosis or microcytosis, and the presence of immature marrow elements in an otherwise normal blood. The early diagnosis of poisoning depends on an evaluation of the complete blood picture rather than on the existence of a leukopenia. Individual susceptibility is so varied and complex that it seems impossible, at least at present, to explain why one individual is poisoned by the same concentration of fumes—all other extrinsic factors being equal—and another is not. As benzene is a fat solvent, perhaps variations in the quantity of blood lipoids control the amount taken up and held in solution. Thus these substances may play a part in poisoning. If true, this may explain and confirm in part the hypothesis that certain foods act in a protective manner. However that may be, poisoning is certainly a product of three factors: the degree of individual susceptibility, the duration of exposure and the concentration of fumes. Therefore, concentration has a relative but not an absolute importance. Splenomegaly may appear in protracted cases of poisoning. Women are no more susceptible to poisoning than men, and acclimatization to the fumes does not seem to occur. The first signs of poisoning may appear with the onset of an infection, long after exposure has ceased. It is doubtful whether any concentration of benzene greater than zero is safe over a long period.

Journal of Pediatrics, St. Louis

15: 469-612 (Oct.) 1939. Partial Index

Nitrogen Metabolism During Oral and Parenteral Administration of Amino Acids of Hydrolyzed Casein. A. T. Shohl, A. M. Butler, K. D. Blackfan and Elsie MacLachlan, Boston.—p. 469.
*Chronic Stridor in Infancy. J. E. Bowman and C. L. Jackson, Philadelphia.—p. 474.
Determination of Vitamin C in Children by Intradermal Injection. H. G. Rapaport and S. H. Miller, New York.—p. 503.
Some Problems of Diphtheria Immunization. M. M. Hillman and J. I. Linde, New Haven, Conn.—p. 513.
*Treatment of Cryptorchidism with Male Sex Hormone. C. Zelson and E. Strinitz, New York.—p. 522.
Traumatic Rupture of Spleen in Children, with Special Reference to Left Shoulder Pain. Nina A. Anderson, Cincinnati.—p. 535.
*Erythema Infectiosum: Clinical Observations During an Epidemic. J. M. Rector, San Francisco.—p. 540.
Amyotonia Congenita (Oppenheim's Disease) Occurring in Two of Triplets. A. Course, Sacramento, Calif.—p. 546.
Amyoplasia Congenita (Arthrogryposis Multiplex Congenita). H. S. Altman and L. T. Davidson, New York.—p. 551.
Pneumococcic (Type III) Meningitis with Recovery. S. H. Welch and H. F. Martin, Birmingham, Ala.—p. 563.
Simplified Method for Scalp Vein Transfusions in Infants. S. A. Kaufman and S. O. Levinson, Chicago.—p. 574.

Chronic Stridor in Infancy.—Bowman and Jackson investigated the causes of stridorous breathing of thirty consecutive infants observed during a period of five years. They found that fourteen of the infants had supraglottic obstruction to inspiration due to deformity or flaccidity of the epiglottis, arytenoids

and/or aryepiglottic folds. Of children who have this difficulty, the epiglottis and arytenoids, forming the upper rim of the larynx, are drawn over the entrance of this organ on inspiration to produce the stridor. Characteristically, in these cases the onset of the noisy breathing was at birth. In five of the cases in which there was noisy breathing, pressure on the trachea was caused by an enlarged thymus gland. Diagnosis in these instances depended a great deal on the observation, on a lateral roentgenogram, of kinking, narrowing and displacement backward of the trachea by a shadow posterior to the manubrium of the sternum. More weight was given to any of these changes when they were observed during full inspiration. Results of endoscopic examinations were negative in all these cases. Before classifying a child in this group, definite improvement in the stridor had to take place forty-eight hours after roentgen treatment. The onset of the symptom in this group was at the second or third month, and the stridor was more marked on expiration. Three of the infants were stridorous because of congenital malformations of the larynx other than those present in the first group. One had weblike ridges in the subglottic area, one a thickening of one of the ventricular bands and one a congenitally small larynx. In each of the eight remaining cases the diagnosis was different: cyst of the thyroglossal duct with pressure on the larynx, tuberculosis of the bronchial lymph nodes, micrognathia, collapse of part of the trachea, congenital heart disease, hypertrophic laryngitis, hypertrophic laryngitis associated with congenital laryngeal stridor; in one case the cause of the altered breathing was not determined. The thirty patients were examined roentgenologically for enlargement of the thymus gland, and twenty-one were found to have some degree of enlargement. Only five infants with enlarged glands were definitely improved after roentgen therapy, while five others were temporarily benefited. Of the nine with thymus glands of normal size there was no change of the symptoms in seven and two were not treated. All these facts reaffirm the difficulty of estimating the importance of this troublesome diagnosis in cases studied because of noisy breathing. Satisfactory study of a child with stridor should include careful x-ray examination of the neck and chest in both planes and an endoscopic examination of the larynx and trachea.

Testis Hormone for Cryptorchidism. — Zelson and Steinitz used the testis hormone in the treatment of twenty cryptorchid boys between 7½ and 13 years of age. Eleven of the twenty children had had previous treatment with gonadotropic substance with no effect. At no time in the past history of the children had the undescended testicle been seen or felt in the scrotum. There was a total of twenty-three undescended testicles; thirteen were palpable and ten were not. Each child was given synthetic testosterone propionate three times a week for from four to ten weeks; the doses varied between 5 and 10 mg. per injection. Four of the boys received a second series of injections of testosterone propionate 5 mg. three times a week in combination with gonadotropic substance (pregnyl) 500 units three times a week for from three to six weeks. The total dosage of gonadotropic substance varied between 4,000 and 8,900 units. None of the children received treatment for longer than ten weeks. Of the eleven boys who had been previously treated with gonadotropic substance two responded to the testosterone treatment: one was affected unilaterally and the other bilaterally; in both the type was pseudo-Froehlich. There was complete descent of testicles in three boys. Of these three, one had unilateral cryptorchidism and two bilateral. Testosterone propionate had a partial effect on some of the other children treated: The testicles of five came down to the lower end of the canal and could be pulled out of the external ring manually but retracted immediately when left alone. The testicles of four which were not palpable at the onset of the treatment became palpable in the canal at the end of treatment. Sixteen boys had enlargement of the penis, eight had enlargement of the scrotum and ten had a definite growth of pubic hair. Only four of the boys showed no effect from the testis hormone. The testicles of five boys became smaller during the course of treatment. In one they became larger. In a four week period one boy grew half an inch in height and another grew 1 inch. Though frequent erections were reported during the course of treatment, there was no discomfort and no history of masturbation. Of the four boys (having unilateral undescended testicles) who had not responded to the testosterone propionate alone and were given a second course of treatment combined with gonadotropic substance, two responded to this treatment with complete descent. One boy with bilateral cryptorchidism for which testosterone propionate was not effective was subsequently given 10,000 units of gonadotropic substance with resultant complete descent of the testicles. The authors conclude that gonadotropic substance is more effective than testis hormone for the treatment of cryptorchidism. However, when there is no response to gonadotropic substance alone a combination of gonadotropic substance and testis hormone will often cause a response.

Erythema Infectiosum. — The characteristics and general course of an epidemic of forty-three cases of infectious erythema are described by Rector, who believes that from a public health standpoint, because of its contagious nature, it would seem advisable to create a place for erythema infectiosum on the official list of reportable diseases. All the available communications on erythema infectiosum report group infections, although the small size, short duration and relative infrequency of these epidemics point either toward a limited degree of contagiousness or to a lack of general susceptibility to the disease. The epidemics usually attain a peak by the third or fourth week and then subside with equal rapidity, the total duration being but a few months or less. While only 128 cases in the San Francisco epidemic were brought to the attention of the department of health the actual morbidity was much greater, as it is not a reportable condition. Further, many of the initial cases were not recognized, while others were so mild that they were overlooked. Sporadic cases are still occurring in San Francisco. Transmission apparently results from a droplet infection, but the specific agent remains unknown. There is a seasonal incidence, the malady being most frequent in the spring. The age group most commonly affected is from 4 to 12 years. There appears to be a decided sex predilection, girls being more often afflicted in a ratio sometimes as high as 2:1. In one San Francisco school all the cases observed were of girls. The incubation period has been reported to be from five to fourteen days. Among the forty-three cases studied by the author the average period of incubation was from seven to eleven days. Occasionally there is a mild prodrome with slight malaise and sore throat, but in the vast majority of cases the rash, making its initial appearance on the cheeks, is the first and only symptom noted. Within twenty-four to thirty-six hours the eruption develops on the trunk and extremities and spreads toward the periphery, the hands and feet being the last portions of the body to be affected. Whereas the eruption disappears rapidly from the face and trunk, it may last from six to fourteen days on the extremities and an interesting evanescence is often seen, the rash fading for hours or days and then reappearing, usually after slight dermal irritation. Subjective symptoms are practically nil. There is no adenopathy or splenomegaly, and the eruption is not followed by desquamation or pigmentation. Moderate leukopenia with relative lymphocytosis and eosinophilia is usually found. The eosinophils vary from 1 to 16 per cent and average from 4 to 6 per cent. Erythema infectiosum is to be differentiated from the other acute exanthems, from erythema exudatum multiforme and from the various urticarial dermatoses arising from foods, drugs and external irritants. In those occasional cases in which the eruption fails to become confluent on the face, German measles may be suspected until the characteristic features of the disease become evident. In sporadic cases confusion with erythema multiforme or urticaria may occur if the rash is present only on the extremities. Here a negative history, asymptomatic course, absence of pruritus, relatively long duration of the eruptive stage and normal sedimentation rate will all assist in determining the true nature of the condition. Aside from mild symptomatic measures, no treatment is required. As the condition is infectious, the patient should be isolated until the eruption has disappeared permanently. Susceptible contacts should be restricted for two weeks.

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FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

20: 371-438 (Oct.) 1939

Serologic Identification of Clostridium Tetani. J. D. Maclennan.—p. 371.
Virus-Inactivating Agent from Human Nasal Secretion. F. M. Burnet, Dora Lush and A. V. Jackson.—p. 377.
Adrenalin Content of Suprarenal Glands in Diphtheria Intoxication. C. A. Ashford.—p. 385.
Neutralization of "Purified" Tumor Agent Suspensions by Antifowl Serum. R. Knox.—p. 391.
Nutrition of Corynebacterium Diphtheriae: Pantothenic Acid as Essential Growth Factor for Certain Strains of Corynebacterium Diphtheriae Gravis: Synthesis of Some Physiologically Active Compounds by Corynebacterium Diphtheriae Cultures in Synthetic Mediums. W. C. Evans, W. R. C. Handley and F. C. Happold.—p. 396.
*Studies in Lead Mobilization. S. L. Tompsett and J. N. M. Chalmers. —p. 408.
Polypeptide Responsible for Some of Phenomena of Acute Inflammation. E. S. Duthie and E. Chain.—p. 417.
Chemical Composition of Active Agent of Rous Sarcoma No. 1 and of Some Related Products. A. Pollard.—p. 429.

Lead Mobilization.—Tompsett and Chalmers studied the effect of high (2.7 Gm. daily) and low (0.13 Gm. daily) calcium diets with and without ammonium chloride in lead poisoning of six lead workers, increased lead absorption in three cases due to lead-contaminated drinking water and one case of lead poisoning due to the latter cause. High calcium diets produced a fall in blood lead, while low calcium diets with and without ammonium chloride produced a rise in blood lead. There was no parallelism between the level of blood lead and lead excretion in the two cases examined. The effect of high and low calcium diets on the distribution of lead between the soft tissues and the skeleton in mice has been studied and it was found that high calcium intakes transfer lead from the soft tissues to the skeleton, while with low intakes the reverse is true.

British Medical Journal, London

2: 841-896 (Oct. 28) 1939

Prophylactic Immunization Against Measles, Scarlet Fever, Diphtheria, Whooping Cough and Influenza. J. C. G. Ledingham.—p. 841.
Ophthalmic Services to Civil Population in National Emergency. A. Irvine-Fortescue.—p. 846.
Transfusion with Stored Blood. J. C. Leedham-Green.—p. 849.
*Choice and Preparation of Blood-Grouping Serums for Emergency Purposes. S. W. Challinor, J. C. J. Ives and C. E. van Rooyen.—p. 850.
Severe Uterine Inertia Treated by Cutting Cervix. J. V. O'Sullivan.—p. 852.

Blood-Grouping Serums for Emergency Purposes.—With the aid of a small quantity of blood-grouping serums, Challinor and his co-workers selected four human volunteers of group II and four of group III. The object was to find out which of them could provide the most active serums for standard typing purposes in emergencies. By setting up a series of increasing dilutions of each individual's serum, to which was added a suspension of erythrocytes, it was possible to determine which of the serums produced clumping in the highest dilution and to ascertain the character and nature of the clumping produced. The results showed that the serum possessing the highest end titer of agglutinins was not necessarily the serum of choice for typing purposes, since the qualitative character of the reaction—for example the size and appearance of the clumps as seen by the naked eye—was a better criterion of the value of serums for typing work than the end titer at which the reaction occurred. It is desirable to add a preservative to typing serum, and phenol was used in order to avoid excessive dilution of the serum. The most suitable two donors from each group were chosen and from half to three fourths of a pint (240 to 360 cc.) of blood was withdrawn from each donor into sterile pint bottles and allowed to stand overnight in the ice box. During this preliminary storage the absorption of any "cold" agglutinins takes place. The separated serum was transferred by means of sterile pipets into sterile 100 cc. bottles. In order to maintain sterility, phenol (5 per cent aqueous solution) was then added to the serum so that the phenol concentration was 0.5 per cent. For distribution purposes the phenolized serum was transferred in 1 cc. quantities to sterile vials fitted with rubber bungs, which were afterward waxed. As an alternative method for the preservation of typing serums the authors used the method employed by Craigie (1931) and Craigie and Tulloch (1931). This is the preservation of serums by exsiccation in vacuo from the frozen state. The only disadvantage of using dried serum is that larger quantities are required than of the fluid serum; but this disadvantage is offset by the fact that desiccated serum is easily distributed and handled, and, in any case, the actual amount of dried serum needed for a typing test is exceedingly small.

Lancet, London

2: 865-920 (Oct. 21) 1939

Profession of Surgery. V. Z. Cope.—p. 865.
Antitumorigenic Action of Testosterone. A. Lipschütz, L. Vargas and O. Ruz.—p. 867.
*Pathogenic Staphylococci: Their Incidence in Nose and on Skin. E. H. Gillespie, E. A. Devenish and S. T. Cowan.—p. 870.
Pancreatic Lithiasis. W. F. Brook.—p. 873.
*Vitamins D2 and D3 in Infantile Rickets: Comparison of Their Therapeutic Efficiency. N. Morris and Mary M. Stevenson.—p. 876.
Effects of Drugs in Myotonia. E. Guttmann and A. B. Stokes.—p. 879.
Control of Gastric Acidity in Peptic Ulcer. B. M. Nicol.—p. 881.
Prognosis in Rabies. J. H. Jordan.—p. 884.

Pathogenic Staphylococci in Nose and on Skin.—Gillespie and his associates point out that during an investigation of an outbreak of septic infections in operative wounds Devenish and Miles found that three of four surgeons tested were nasal carriers of Staphylococcus aureus. One of these three was a persistent cutaneous carrier of a strain of Staphylococcus aureus identical with the nasal strain. Since there appears to be no record of any survey of the incidence of staphylococci both in the nose and on the skin in which the cocci were identified as potentially pathogenic, Gillespie and his associates determined the nasal and cutaneous carrier rates in medical students. Two surveys were made. In the first, swabs were made of 159 students. Of the 159 nasal swabs, sixty-nine were positive, a nasal carrier rate of 43.4 per cent. There were thirty-one (19.5 per cent) cutaneous carriers (right or left wrists or both). The total population may be conveniently divided into four groups: group A are nasal carriers, B double carriers, C cutaneous carriers and D noncarriers. Approximately 50 per cent are carriers of Staphylococcus pyogenes, which in 30 per cent occurs only in the nose, in 13 per cent in the nose and on the skin—double carriers—and in only 7 per cent on the skin alone. There was no relation between the carrier rates and the length of the students' sojourn in the hospital, nor was there any association with the age or sex of the student. Regarding the nasal carrier state and the history of chronic nasal disease, the authors say that of the population sampled thirty-nine gave a history of chronic nasal disease in the form of discharge, chronic catarrh or sinusitis; twenty-five of these were nasal carriers of Staphylococcus pyogenes. The percentage difference between the incidence of nasal disease in nasal carriers and in the remainder of the students is 20.7 ± 6.9, suggesting that there is an association between the two conditions. About the relationship of nasal and cutaneous carrier states and infections of the skin, the authors say that several of the persons tested had a history of superficial cutaneous infections, such as boils or pustules. The positive carriers showed a slightly higher percentage of cutaneous infections, but the difference is not statistically significant. The second survey, made several months later, was designed to test the constancy of the nasal and skin carrier states and their association and to compare the incidence of Staphylococcus pyogenes on the skin, determined by superficial swabbing, with that in the deeper parts of the skin. Ten students were selected at random from each of the four groups A, B, C and D and swabs were made as before. They also washed up as for an operation. After putting on dry sterile rubber gloves each student was exposed to a humid atmosphere. Sweating was induced by the immersion of the gloved hands in a hot water bath. As soon as perspiration appeared on the forehead and inside the gloves, 0.5 cc. of broth was pipetted into each glove and well massaged into the hands. The gloves were then peeled off and their inside surfaces pressed on to Fildes's agar plates, which were incubated and examined for Staphylococcus pyogenes. This survey revealed that some of the students remained in their original groups, while in others changes occurred. Repeated swabbing of the nose revealed a relative constancy of the nasal carrier state. The glove test distinguishes those who carry Staphylococcus pyogenes superficially enough for its complete removal by surgical scrubbing from those in whose skin

the infection is deep. There were fifteen superficial cutaneous carriers among the forty students tested, but of these only five were deep carriers by the glove test. Moreover, all five deep carriers were in the double carrier group. In all five the glove strains were identical with the superficial skin strains, and in four of the five the nasal strain belonged to the same serologic type. It appears, therefore, that the persistent cutaneous carrier state in a surgeon tested by Devenish and Miles was not an isolated phenomenon but one which is relatively common.

Vitamins D_2 and D_3 in Rickets.—Morris and Stevenson show that the clinical investigations so far recorded are by no means unanimous as to the relative potencies of vitamins D_2 and D_3 in the treatment of rickets in the infant. In the present study they attempt to compare the potency of crystalline vitamins D_2 and D_3. The real difficulty of the assay was to make certain that the only variable was the vitamin. The diet was a milk mixture consisting of two-thirds milk and one-third water, with sugar and oat flour in amounts suitable for the age of each patient. The infants were kept together on the same side of the ward out of direct sunlight. As far as possible, infants of the same age were used for comparison. Every patient was kept in the ward for at least three weeks before the vitamin was administered, to ensure as far as possible that the rickets had not begun to heal before specific antirachitic therapy was instituted. It was felt that any differences in the effects of vitamins D_2 and D_3 would be best detected if the dosage was on the low side. Since ordinarily a patient with rickets would almost certainly be receiving some antirachitic factor either in the diet or by natural ultraviolet irradiation, it was felt that a dose of 2,000 international units a day was on the low side for curative purposes. This amount was given to each patient, irrespective of age and weight. Accordingly the dose varied with each pair from 140 to 286 international units per kilogram of body weight daily. The authors studied the course of healing in twelve infants and children with active rickets, six of whom were given vitamin D_2 and six vitamin D_3. Serial x-ray studies were made of the wrists, and the plasma phosphatase was estimated. The results revealed no significant difference between the therapeutic effects of these two vitamins on rachitic infants and children.

New Zealand Medical Journal, Wellington

38: 301-374 (Oct.) 1939

Infections of the Hand. A. Mason.—p. 304.
Conservative Surgery of Cancer of Rectum. D. Robb.—p. 316.
Phases in Investigation of Results of Head Injury. I. M. Allen.—p. 324.
Serologic Diagnosis of Cancer: Review of Present Position. E. F. D'Ath.—p. 334.
Some Psychologic Aspects of Deafness. W. Macdonald.—p. 341.
Nasal Sinusitis in Children. L. S. Talbot.—p. 344.

Practitioner, London

143: 357-460 (Oct.) 1939

Advances in Medicine. A. Hall.—p. 357.
Advances in Surgery. G. E. Gask.—p. 363.
Advances in Dietetics. J. D. Comrie.—p. 368.
Advances in Treatment of Rheumatic Diseases. C. W. Buckley.—p. 376.
Advances in Treatment of Diseases of Kidney. R. Platt.—p. 384.
Advances in Anemia and Blood Diseases. L. E. H. Whitby.—p. 391.
Advances in Treatment of Diseases of Skin. J. T. Ingram.—p. 398.
Advances in Ophthalmology. H. B. Stallard.—p. 409.
Advances in Diseases of Ear, Nose and Throat. W. G. Scott-Brown.—p. 420.
Advances in Treatment of Diseases of Children. A. Moncrieff.—p. 429.
Modern Therapeutics: IV. Therapeutics of Digitalis. Rae Gilchrist.—p. 436.

Chinese Medical Journal, Peiping

56: 197-302 (Sept.) 1939

Tuberculosis of First Infection and of Reinfection: Their Frequency in Chinese People of Peking. E. L. Opie.—p. 197.
Tuberculosis of First Infection in Adults from Rural Districts of China. E. L. Opie.—p. 216.
Peking Diets: III. During Dysentery. R. A. Guy and K. S. Yeh.—p. 225.
Relative Changes of Blood and Cerebrospinal Fluid Sugar in Schizophrenic Patients Treated with Insulin. T. H. Suh, Y. C. Chang and I. Chang.—p. 232.
Seasonal Incidence of Kala-Azar in Infants and Its Significance in Relation to Transmission Problem of the Disease. I. C. Yuan, F. T. Chu and C. U. Lee.—p. 241.
Studies on Control of Fecal-Borne Diseases in North China: VII. Epidemiology of Parasitic Amebas. G. F. Winfield and T. H. Chin.—p. 265.

Bruxelles Médical, Brussels

19: 1541-1567 (Oct. 29) 1939

*Endocrine Gland in Wall of Renal Arterioles. N. Goormaghtigh.—p. 1541.
Malaria Therapy: Clinical and Social Results in Dementia Paralytica: Cm. R. Bernard.—p. 1550.

Endocrine Gland in Wall of Renal Arterioles.—Goormaghtigh believes that he has traced a previously unknown endocrine gland to its site in the wall of the arterioles of the kidneys. This gland, according to the author, consists of muscle cells devoid of muscle fibrils within the media of the renal arterioles at the point where the capillary ramifications constitute a glomerular tuft and the fibrilless cells aid in forming a juxtaglomerular structure with regulating effect on glomerular circulation. In his morphologic studies on animals the author found, especially in rabbits, that a variable number of cells of the juxtaglomerular organs, clearly resembling chromophil cells of the anterior lobe of the hypophysis, contained acidophil and basophil secretory granules. In his experimental studies of the fibrilless cells in dogs and rabbits he observed that renal ischemia provoked hypertrophy and the multiplication of certain cells normally devoid of fibrils in the media of the renal arterioles, causing the transformation of muscle cells with fibrils into cells without fibrils, these cells becoming granular in rabbits and occasionally so in dogs. He also noted that, if ischemia persisted for several months, numerous fibrilless substances in the arteries of the kidneys of dogs likewise became granular and acquired endocrine characteristics. The author feels justified in concluding that, since renal ischemia stimulates almost exclusively the cells of the media of the renal arterioles, the source of the hypertensive hormone must be sought in these cells. He also thinks that hypertension secondary to nephritis, the etiology of which is still obscure, may be attributed to the stimulation of the fibrilless cells of the juxtaglomerular organs. Definite proof of this new gland awaits hormonal isolation from the media of renal arterioles, though, as the author points out, the endocrine function of the islands of Langerhans was discovered twenty-five years before the isolation of insulin.

Presse Médicale, Paris

47: 1453-1476 (Oct. 28-Nov. 1) 1939

Immobilization in Closed Plaster Cast in Treatment of War Wounds. J. Leveuf.—p. 1453.
*Insulin Therapy in Diabetes. H. Chabanier and C. Lobo-Onell.—p. 1454.
Hypertonia of Levator Muscles of Eyelids: Physiopathologic Mechanism of Graefe's Sign. A. Kreindler.—p. 1457.

Insulin Therapy in Diabetes.—Chabanier and Lobo-Onell stress the normalization of glycemia in diabetic persons, not merely the reduction of glycosuria, as the significant thing in the management of diabetes. Fortified by seventeen years' use of a technic that employs a moderate carbohydrate regimen in conjunction with relatively large doses of insulin (800 units within fourteen hours; from 240 to 400 units within twenty-four hours), the authors challenge the therapeutic practice of carbohydrating and insulinizing the patient with small doses (10, 20, 30 units) into a state of sugar free urine, with little or no regard to hyperglycemia. Their statements are based on the superior results claimed for their method in protecting diabetic persons against postoperative sequels when surgery had to be resorted to, against infectious diseases such as anthrax and gangrene, against supervening complications, organic and neurosensory, and against the evolution of diabetes. For example, no cases of postoperative acetonemia or death occurred in 111 diabetic persons primarily treated for glycemia, whereas, in twenty-one cases treated for glycosuria, serious keto-acidosis and four deaths resulted after surgical intervention. No infectious aggravation of anthrax was noted among their own patients; furuncles observed in eleven of their patients did not proliferate, whereas, of fifteen patients under glycosuria control, eleven developed anthrax, three died in coma and three died from septicemia. Gangrenous infection, though frequently observed in their own patients, did not evolve and healed normally after incision, whereas eleven deaths occurred among twenty-seven persons treated for glycosuria, keto-acidosis, coma and septicemia. Only thirteen instances of arthritic gangrene were noted by the authors among their own patients within thirteen years, whereas numerous cases of organic and neurosensory complications were observed in persons treated primarily for glycosuria.

According to the authors, insulin not merely constitutes a substitutive medication but is capable of curative effects both in adults and in children in the sense that improvement is achieved while glycemia is maintained within normal limits on an uninterrupted carbohydrate regimen and the doses of insulin are reduced. In one case a daily dose of 200 units could be reduced to from 16 to 18 units without affecting the glycemic level. They believe that while their method is no guaranty against diabetic gangrene it confers maximal prophylaxis.

Schweizerische medizinische Wochenschrift, Basel

69:941-964 (Oct. 21) 1939. Partial Index

Nutrition in Hospitals. H. Kapp.—p. 943.
Treatment of Hormone Deficiency Diseases. F. Grote.—p. 947.
*Examination of Thrombocytes in Unstained Dark Field Preparation. A. Fonio.—p. 952.
Importance of Technic in Heliotherapy. A. Rollier.—p. 958.

Thrombocytes in Dark Field Preparation.—According to Fonio the dark field preparation permits the visualization and the photomicrographic reproduction of the individual thrombocyte in its various evolutive phases. It reveals that the thrombocyte is a cell which consists of cytoplasm and granules, which presumably have the role of the nucleus. The granules are highly luminous formations; their number differs and their distribution in the cytoplasm is irregular particularly in the irritative forms, whereas in the quiescent forms they are centrally located, like a nucleus. The behavior of the cytoplasm varies with the evolutive form of the cell. Shortly after centrifugation the thrombocyte has a roundish or oval form with short pseudopodia, which gradually increase in length. There are several types of pseudopodia: (1) wide and rigid ones and (2) narrow and long ones with screw-like movements. The latter pseudopodia, which might be designated as "haptopodia," may become quite long and may, apparently induced by chemotactic stimuli, reach out for other thrombocytes or other particles. Some pseudopodia branch out into secondary pseudopodia. The author describes the changes in the thrombocytes before, during and after the precipitation of fibrin and what happens when several thrombocytes come together, and he analyzes the biologic significance of the cytoplasm and of the granules. He shows reproductions of a number of photomicrographs of thrombocytes.

Policlinico, Rome

46:1895-1936 (Oct. 30) 1939. Practical Section

*Sterilization of Diphtheria Carriers. V. Lanza and E. Di Fulio.—p. 1895.
Spastic Paraplegia of Little's Type. E. Rizzatti.—p. 1897.

Sterilization of Diphtheria Carriers.—Lanza and Di Fulio used daily local applications of pure anatoxin on the nasal, pharyngeal, laryngeal or laryngopharyngeal mucosas of a group of eighty-four carriers harboring diphtheria bacilli. The group included convalescents and healthy carriers. In resistant cases the local treatment was given in association with hypodermic injections of increasing doses (0.5, 1, 1.5 and 2 cc.) of anatoxin. The injections were administered at intervals of five or six days up to a total number of two or four. Control of the bacilli was verified by cultural researches, which were carried on at intervals of five days. Sterilization was obtained in seventy cases in from five to thirteen days and in fourteen cases in from fourteen to twenty-five days. The treatment is simple and harmless.

Deutsche medizinische Wochenschrift, Leipzig

65:1405-1444 (Sept. 8) 1939

Plasma Therapy of Exsiccation. G. Bessau and W. Ubse.—p. 1405.
*Lactating Ability and Its Duration. A. Reuss.—p. 1410.
Shock Treatment and Prophylaxis of Rickets. G. O. Harnapp.—p. 1414.
Metabolic Changes and Effect of Adrenal Cortex Extract and Vitamin C in Diphtheria. J. Dieckhoff.—p. 1418.
Treatment of Tuberculosis of Joints. A. Wittek.—p. 1421.
Examination of Heart and Differential Diagnosis by Means of Electrocardiogram and Kymogram. H. Reindell.—p. 1423.

Lactating Ability and Its Duration.—According to Reuss the diagnosis "deficient lactating ability" is hastily made in most cases. Women with hereditary deficiency of lactation are in the minority and a number of women producing a small amount of milk at the start of breast feeding may be brought to provide more than half or even all the child's requirement by systematic pumping, which still is the best means of rendering lactation more active. The cooperation of the patient is essential in this process. Forceps delivery, severe hemorrhages, eclampsia and particularly puerperal fever may considerably influence lactation during the puerperal period. It is not right to speak of a deficient lactating ability in such cases, and the temporarily retarded activity of the mammary glands can be remedied as soon as the patient gets well and appropriate measures have been taken. "Initial hypogalactia," the term used by the author, is particularly frequent in mothers of prematurely born children. Laziness or weakness of the infant in sucking may sometimes convey the impression of hypogalactia of the mother. It is advisable in such cases to evacuate the mammary glands by mechanical means and feed the breast milk to the child from a bottle. The lactating ability of mothers can be maintained and only a serious disease such as mastitis can impair the activity of the mammary glands. The author recommends the creation of more ample facilities for admitting the mothers with the infants to clinics and hospitals. Mothers and students would both benefit thereby. Institution of mother's milk bureaus on a larger scale is likewise recommended.

Folia Haematologica, Leipzig

63:1-144 (No. 1) 1939. Partial Index

Pathogenesis of Transmittable Chicken Leukemia. E. Storti and M. Brotto.—p. 1.
*Determination of Mean Red Blood Cell Diameter and Its Clinical Value. L. Schalm.—p. 34.
Experimental Investigations on Change of Blood Groups in Vitro. V. Papilian and V. Preda.—p. 83.
Cyanosis and Anemia in Chronic Acetanilid (Antifebrin) Intoxication. E. Meulengracht and E. Lundsteen.—p. 89.

Diameter of Erythrocytes.—Schalm reviews and evaluates the different methods that have been recommended for the measurement of the erythrocytic diameter. Direct measurement is accurate but time consuming. The method in which the cells are projected, drawn and measured afterward probably yields the most reliable results. The measuring of 200 cells is generally sufficient. Only in cases of considerable anisocytosis is it advisable to measure a larger number of cells. For clinical use the diffraction method is usually employed. Practice has taught that the deviations from the norm are reliably rendered by this method. Schalm also discusses the clinical value of the determination of the erythrocyte diameter. He admits that there are physiologic differences, but as a rule the normal values do not differ more than 0.4 micron. A considerable deviation of the size of the red blood cells indicates the existence of a pathologic condition, but a normal diameter does not exclude such a process. In pernicious anemia the enlarged diameter is a typical symptom, which appears early in the development of the disease. In fully developed cases the diameter is enlarged by 1 micron or more. Since the introduction of the liver treatment of pernicious anemia, considerable attention has been given to changes in the erythrocyte diameter. It was observed that the diameter decreased after this treatment. If the diameter increases during the maintenance treatment, it must be concluded that the treatment is insufficient. In sprue and similar conditions the mean diameter of the erythrocyes is often found to be distinctly enlarged. Normal diameters have been found in true cases of sprue. Moreover, the changes in the diameter are not a reliable indicator of improvement or relapse in sprue. After successful treatment the cells may remain enlarged. Changes in the mean diameter have been observed in the anemias that are thought to be due to defective formation of the antianemic principle, for instance in the anemia that is caused by dietary deficiency or in the anemia after gastrectomy. Macrocytosis has been observed also in the so-called pernicious anemia of pregnancy and in the anemias due to infestation with helminths. In the so-called secondary hypochromic anemias, the erythrocyte diameter is often smaller than normal. In hemolytic jaundice the microcytosis is usually quite pronounced, the reduction of the erythrocyte diameter amounting to about 1 micron. Although microcytosis may be of value in the diagnosis of hemolytic jaundice, its absence does not justify the rejection of this diagnosis. In neurologic disorders the determination of the erythrocyte diameter may help to decide whether such a disorder is due to pernicious anemia or not. Finally the author discusses the erythrocyte diameter in leukemia, in malaria, in renal and circulatory diseases and in endocrine disturbances. In the concluding summary he stresses among other factors that it is wise not to attach too much value to small changes in the diameter.

Klinische Wochenschrift, Berlin

18: 1237-1268 (Sept. 16) 1939. Partial Index

*Indications for Surgical Treatment of Pericarditis. H. H. Westermann. —p. 1237.
Position of Lactose in Nutrition of Nurslings. G. Malyoth and S. Kirtmikis.—p. 1240.
Serum Iron and Liver. G. Hemmeler.—p. 1245.
Modification of Whooping Cough by Flying at High Altitudes. F. Pflug and Hildegard Jungheim.—p. 1247.
Demonstration of Sulfanilamides (Prontosil, Uliron, Albucid and Others). K. G. Krebs and H. Franke.—p. 1248.
Action of Prontosil Against Erysipelas. Y. Ishikawa.—p. 1251.
Counting of Thrombocytes. Villaribo and J. Vazquez Pimentel.—p. 1253.

Surgical Treatment of Pericarditis.—According to Westermann, surgical treatment of pericarditis has increased in recent years, not because of the more frequent occurrence, especially of its callous or contracting forms, but rather because this syndrome has become better known. Two circumstances are influential in the appearance of severe functional disturbances of the heart: (1) the extension of the inflammation of the pericardium to the mediastinum with adhesions on the posterior wall of the sternum and on the ribs (accretio cordis) and (2) the shrinkage of a concentric callosity with compresson of the heart and contraction at the site of entry of the large vessels (concretio pericardii). The author points out that the technic for the resection of the pericardium was developed chiefly by Schmieden, who in thirty-four cases had a total mortality of 44.1 per cent and 55.9 per cent of cures or improvements. The author thinks that 56 per cent of cures or improvements must be regarded as a considerable advance, particularly in the treatment of the callous and contracting terminal forms of pericarditis. He believes that the mortality could be reduced still further if the patients were not all in an advanced stage of the disease at the time of the operation but were subjected to treatment during the earlier stages. Since there is little prospect of further improvement in the already highly developed surgical technic, the author thinks that a betterment of the surgical results can be expected only from a better selection of the cases. At the author's clinic not every patient with pericarditis is subjected to an operation, but only those who require it and who may be expected to tolerate it. Pericarditis without a tendency to shrinkage and contraction may be cured without a surgical operation. However, in the callous and shrinking forms in which the inflow of the blood is impaired, an early operation provides the best prospects of permanent success. Such an early operation presupposes an early diagnosis, which will be possible only if physicians recognize the symptoms. The operation is contraindicated only during the exudative stage of pericarditis, because when performed during this stage it is frequently followed by prolonged, occasionally tuberculous, fistulous suppurations. The only operation that promises success is not the precardial cardiolysis but rather a partial resection from the shrunken pericardium.

Medizinische Klinik, Berlin

35: 1253-1276 (Sept. 22) 1939. Partial Index

Diagnosis, Evaluation and Treatment of Hodgkin's Disease. K. Ebhardt. —p. 1253.
*Aspects of Familial Leukemia. A. Decastello.—p. 1255.
Treatment of Pain with Dolantin, a Synthetically Produced Spasmolytic and Analgesic. H. Schlungbaum.—p. 1259.
Occupational Injuries of Heart. K. Blumberger.—p. 1260.

Familial Leukemia.—Decastello cites a number of investigators who observed and discussed familial leukemia, directing especial attention to a report by J. Weiss, to which his attention was drawn in connection with a case of leukemia that came under his observation. His patient, a woman aged 48, proved to be a member of the family in which Weiss had discovered five cases of lymphocytic anemia. After describing the clinical history of this woman the author shows a diagram of the genealogical tree of the family under consideration. This diagram indicates that, of five siblings, three, a sister and two brothers, had chronic lymphocytic leukemia, that the aforementioned sister had seven children, two of whom developed the same disorder, and that a daughter of one of the two leukemic brothers likewise developed lymphocytic leukemia. The latter patient was the woman who came under Decastello's observation, whereas the other five cases had been observed by Weiss. Decastello briefly reviews the histories of the cases presented by Weiss and says that, although only one of the six cases of familial lymphocytic leukemia was verified by necropsy, the diagnosis can be regarded as definitely established in all except one of the cases. In this case the disorder took an aleukemic and subacute course and it is possible that the disorder in question was a lymphosarcomatosis. In only one instance did the leukemia appear during youth and in this case the course was extremely slow (fourteen years). In all others it developed when the patients were between 40 and 50 years of age and terminated in from five months to four years. The author concludes that the occurrence of these six cases of leukemia in two generations of the same family indicates that a hereditary factor may occasionally be a factor in leukemia.

Strahlentherapie, Berlin

65: 547-720 (Aug. 23) 1939. Partial Index

Primary Biochemical Effects of Roentgen Rays. B. Belluccl.—p. 547.
Photopathology: Fundamental Principles and Most Recent Results. H. Jausion.—p. 569.
*Fractional Roentgen Therapy in Advanced Uterocervical Carcinomas Involving the Urogenital Tract. H. Kirchhoff.—p. 579.
Individual Radium Therapy in Uterocervical Carcinomas. H. Reichenmiller.—p. 595.
Demarcation of Surgical and Roentgen Ray Indications in Cancer Control. L. Schönbauer.—p. 607.
Effect of Single Roentgen Doses on Bone Marrow of White Mouse. H. Langendorff and W. Papperitz.—p. 624.

Fractional Roentgen Therapy in Advanced Uterocervical Carcinoma.—According to Kirchhoff, ureteral complications in uterocervical carcinomas are frequently observed roentgenologically and constitute the most common cause of the fatal termination of this disease through the stages of oliguria, anuria and uremia. While radium therapy shows a greater mortality debit than roentgen irradiation, the latter is, says the author, by no means so innocent of ureteral strangulation as assumed. He records the various measures proposed to destroy tumor formations and thus to relieve and release ureteral constriction and reports the successful application of simple fractional irradiation (modified Coutard method) in five of seven cases (one recidivation with bilateral hydronephrosis) of cervical carcinoma. The age level of the patients was between 31 and 68 years. Fractional therapy, employed by the author in hundreds of cases, calls for a single skin dose of 400 surface roentgens. The individual field receives from eight to ten of such applications within forty-eight hours, equivalent to a total of from 3,200 to 4,000 roentgens. Areas thus treated are the abdomen, back, sides and several perineal and vulval fields. The author regards as imperative, in cases of cervical carcinoma, the systematic examination of the urogenital tract by means of roentgen rays in addition to cystoscopic study and residual nitrogen determination. Bilateral constrictions require extreme care in roentgen ray management to prevent ureteral strangulation. In unilateral constrictions, the healthy kidney may be presumed to assume the function of the diseased. However, roentgen irradiation may evolve reflex constriction of the healthy kidney, for which ureteral catheterization is mandatory. The author thinks that in cases in which the parenchyma of the organ has been seriously impaired and hydronephrosis has existed for a long time, no reconstruction can be counted on. Fractional roentgen therapy with high dosage, involving even the possibility of sequels, is indicated whenever every other therapeutic management is contraindicated.

Zeitschrift f. d. ges. experimentelle Medizin, Berlin

106: 213-376 (Aug. 22) 1939. Partial Index

Effect of Eck Fistula and Reversed Eck Fistula on Function of Liver and Modification of Bile Pigment: I. F. Gebhardt.—p. 213.
Purine Nitrogen and Total Nitrogen Obtained by Sternal Puncture as Measure of Cell Content of Bone Marrow: I. H. E. Bock and K. Felix.—p. 235.
Id.: II. H. E. Bock and K. Felix.—p. 243.
Determination of Porphyrin Content of Blood. O. Schumm Assisted by G. Knop.—p. 252.
*Effect of Nicotine on Potassium and Calcium Blood Content and on Potassium/Calcium Quotient. P. Scheer.—p. 314.

Effect of Nicotine on Potassium and Calcium Blood Levels.—Scheer investigates the effects of nicotine on the potassium and calcium levels in man (forty) and rabbits (ten). The forty persons chosen consisted, for the most part, of healthy men, women, younger persons, a few patients afflicted with gastritis and ventricular and duodenal ulcers and included smokers and nonsmokers. The investigation excluded persons in whom an endocrine disease was indicated. Tests on man were made by extracting venous blood before food ingestion

followed by the inhalation of two or three cigarets of from 1 to 1.1 Gm., all of the same brand. The second blood sample was taken at the height of nicotine intoxication evidenced by sweat, nausea, vomiting, tremors and so on. Further blood samples were taken at intervals of fifteen, thirty, forty-five and sixty minutes, partly also after ninety, 120 and 180 minutes, throughout under conditions of food abstention. The author indicates the methods employed to determine potassium and calcium levels and the procedure adopted for the determination of these levels in the rabbits. He found that the average potassium level of 21.49 mg. per hundred cubic centimeters and the average calcium level of 11.8 mg. corresponded with the levels recorded in the literature. The evaluation of the results of the nicotine reaction necessitated the formation of three groups. The first group (70 per cent) showed an increase of the calcium level, varying individually between 16.8 mg. per hundred cubic centimeters and a percentage that did not exceed the average by more than 1 and 1.5. Return to normal levels occurred on an average after forty-five minutes and at the latest after sixty minutes; a few cases, however, falling below the potassium level. On the other hand, the potassium level decreased at various intervals, occasionally after forty-five minutes, and was characterized by further irregularities. The fall of the potassium/calcium quotient was indicative of a sympathicotonic reaction. In the second group (9 per cent) the potassium level showed an increase and the calcium level a decrease, a process evolving within forty-five to sixty minutes, at which time the calcium level attained its initial stage while the potassium level continued to rise in most cases, so that increased levels could be observed after from ninety to 120 minutes. The potassium/calcium quotient was indicative of a vagotonic reaction. In the third group (22 per cent) a regular increase of potassium and calcium levels, occurring within the same time as that of the other two groups, was observed. The author discovered that the cases of gastritis and ventricular and duodenal ulcers fell within this group and that the nicotine elicited increased potassium and calcium responses, considerably so in the case of potassium. The potassium/calcium quotient in this third group was enhanced. No essential differences were noted in the reactions of youths, adults, smokers and nonsmokers. Toxic phenomena differed individually or in degree. The toxic effects in the rabbits, especially after intravenous injections, consisted of tachycardia, tachypnea, salivation, occasional tonic-clonic spasms and a noticeable loss of weight at the end of the probation period. Subcutaneous injections of 1 mg. per kilogram of nicotine solution administered daily for four weeks induced an increase in the potassium and calcium levels of the serum. Increased intoxication induced by intravenous injections of from 0.5 to 1 mg. per kilogram of nicotine tartrate for six days could heighten the levels only to a small degree. It was found that three days after the injections were terminated the potassium and calcium serum levels sank and that after about three weeks the initial levels were restored.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 4713-4824 (Sept. 30) 1939. Partial Index

Keratitis Rosacea. G. F. Rochat.—p. 4717.
*Serious Eye Complications in Scarlet Fever: Four Cases. H. W. Scalongne.—p. 4722.
Isometric Contraction of Muscle. J. W. Langelaan.—p. 4732.
Arthrography of Hip Joint in Congenital Dislocation of Hip. F. R. van de Stadt.—p. 4736.
Posttraumatic Shock and Gas Gangrene Successfully Treated with Several Great Blood Transfusions and Sulfanilamide. D. K. Wielenga.—p. 4740.
Treatment of Scapulohumeral Arthrosis. C. van Luijt.—p. 4747.
Intracardiac Injection of Lobeline in Asphyxia of the Newborn. B. Bosch.—p. 4750.
Metatarsal Fracture (Military Foot). L. S. Wildervanck.—p. 4751.

Eye Complications in Scarlet Fever.—Scalongne reports that a child aged 18 months had a serious conjunctivitis from scarlet fever. The conjunctivitis did not yield to the customary treatment but was followed by keratitis, phlegmon of the upper lid and retrobulbar abscess, which lesions healed with a large residual macula corneae. After that the other eye became involved. There were conjunctivitis, phlegmon of the upper lid, panophthalmia and atrophia bulbi. Rhinitis developed and there was a discharge from the nose and both eyes. Bacteriologic examination of the conjunctival secretion revealed Streptococcus haemolyticus. The child died several months later during an attack of high fever, but permission for a necropsy was refused. At first the author was not certain that the ocular complications were caused by scarlet fever, but observations in other cases made this seem probable. A second child was hospitalized with the typical symptoms of scarlatina. On the fourth day rhinitis and conjunctivitis developed. This was followed by keratitis, phlegmon of the upper lid and atrophia bulbi. On the other eye there developed, almost simultaneously, conjunctivitis and keratitis. The resulting vision permitted only reception of light. A third child with scarlatina had conjunctivitis at the time of admittance and soon keratitis and phlegmon of the upper lid developed. After this eye had almost healed, a phlegmon developed on the upper lid of the other eye, followed by eversion of the lids, necrosis of the conjunctiva and probably panophthalmia. At the postmortem examination purulent meningitis was discovered. In the fourth case purulent conjunctivitis developed followed by phlegmon of the upper lid and keratomalacia, leaving a macula on the lower half of the cornea but good vision. Simultaneously the other eye showed a phlegmon of the upper lid and keratoconjunctivitis. After healing, a small macula remained. The author thinks that the nasolacrimal duct cannot be considered the route of infection, although such cases have been reported in the literature; nor can secondary infection be clearly demonstrated as a cause. He thinks that there is a possibility that hypovitaminosis played a part in the development of the lesions. Although there were some indications of hypovitaminosis, valid proof of its causal significance could not be furnished.

Acta Medica Scandinavica, Stockholm

100: 163-274 (Oct. 17) 1939. Partial Index

Biochemical Studies on B1 Avitaminosis in Animals and Man. B. Carlström, K. Myrbäck, N. Holmin and A. Larson.—p. 175.
*Vitamin A and Respiratory Infections. M. Uddström.—p. 214.
Blood Syndrome in Cases of Metastatic Tumors of Bone Marrow and of Leukaemia. F. S. P. van Buchem and D. J. J. M. Hendriksen.—p. 243.
Oxygen Consumption of Various Striated Muscles in Vitro. N. Alwall.—p. 258.

Vitamin A and Respiratory Infections.—Uddström says that the significance of vitamin A for the resistance against infections and for the favorable modification of existing infections is generally accepted. However, objections have been made against the use of the term "anti-infectious vitamin." Objectors to this term have pointed out that vitamin A is only one of the many constituents of a well balanced diet which insures an adequate defense of the organism against infections. The author thinks that a diet which is so deficient in vitamin A that it results in symptoms of vitamin A deficiency is insufficient also in other respects. In this report he gives his attention to whether the subclinical or latent forms of vitamin A deficiency are likewise accompanied by an increased susceptibility to infections and whether the administration of vitamin A is advantageous in the absence of signs of vitamin A deficiency. He reports investigations on school children in a Swedish industrial region with a high percentage of unemployment. One half of the children for four months were given daily, except Sundays and holidays, 8,000 international units of vitamin A. The suggestive factor was eliminated by giving to the other children an indifferent substance of similar appearance. The medication with vitamin A exerted no influence on the growth in height or on the increase in weight; moreover, as regards infections of the respiratory passages it had no influence on the morbidity. On the basis of reports in the literature and of his own investigations the author concludes that the present knowledge about vitamin A does not justify the maintenance of the term "anti-infectious vitamin," at least if it is to designate an action that is entirely different from that of other nutritive substances. It may be regarded as definitely established that in cases in which there exists a great deficiency in vitamin A the resistance against infections of the respiratory tract is impaired. However, it cannot be asserted that slight degrees of vitamin A deficiency impair the resistance against respiratory infections. An oversupply of vitamin A is of no special advantage with regard to susceptibility for infections of the air passages. A favorable action of medication with vitamin A on the incidence, duration or severity of respiratory infections justifies the conclusion that a considerable vitamin A deficiency existed.

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JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, JULY-DECEMBER 1939

Titles have been listed or Abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past six months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to members of the American Medical Association for a period not exceeding three days. Three journals may be borrowed at a time. No journals are available prior to 1930. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Thus most of these journals are accessible to the general practitioner.

Acta chirurgica Scandinavica. Stockholm.
Acta medica Scandinavica. Stockholm.
Acta medica URSS. Moscow.
Acta obstetricia et gynecologica Scandinavica. Stockholm.
Acta orthopaedica Scandinavica. Copenhagen.
Acta pediatrica. Stockholm.
Acta psychiatrica et neurologica. Copenhagen.
Acta radiologica. Stockholm.
Acta tuberculosea Scandinavica. Copenhagen.
American Heart Journal. St. Louis.
American Journal of Cancer. New York.
American Journal of Clinical Pathology. Baltimore.
American Journal of Digestive Diseases. Huntington, Ind.
*American Journal of Diseases of Children. A. M. A., Chicago.
American Journal of Hygiene. Baltimore.
American Journal of Medical Jurisprudence. Boston.
American Journal of the Medical Sciences. Philadelphia.
American Journal of Obstetrics and Gynecology. St. Louis.
American Journal of Ophthalmology. St. Louis.
American Journal of Orthopsychiatry. Menasha, Wis.
American Journal of Pathology. Boston.
American Journal of Physiology. Baltimore.
American Journal of Psychiatry. New York.
American Journal of Public Health. New York.
American Journal of Roentgenol. and Radium Therapy. Springfield, Ill.
American Journal of Surgery. New York.
American Journal of Syphilis, Gonor. and Venereal Diseases. St. Louis.
American Journal of Tropical Medicine. Baltimore.
American Review of Tuberculosis. New York.
Annales de dermatologie et de syphiligraphie. Paris.
Annales d'endocrinologie. Paris.
Annales de médecine. Paris.
Annali Italiani di chirurgia. Bologna.
Annals of Internal Medicine. Lancaster, Pa.
Annals of Medical History. New York.
Annals of Otology, Rhinology and Laryngology. St. Louis.
Annals of the Rheumatic Diseases. London.
Annals of Surgery. Philadelphia.
Archiv für Dermatologie und Syphilis. Berlin.
Archiv für Gewerbepathologie und Gewerbehygiene. Berlin.
Archiv für Gynäkologie. Berlin.
Archiv für Kinderheilkunde. Stuttgart.
Archiv für klinische Chirurgie. Berlin.
Archiv für Kreislaufforschung. Dresden.
Archiv für Ophthalmologie. Berlin.
Archiv für Psychiatrie und Nervenkrankheiten. Berlin.
*Archives of Dermatology and Syphilology. A. M. A., Chicago.
Archives of Disease in Childhood. London.
*Archives of Internal Medicine. A. M. A., Chicago.
Archives des maladies de l'appareil digestif. Paris.
Archives des maladies du cœur. Paris.
Archives de médecine des enfants. Paris.
*Archives of Neurology and Psychiatry. A. M. A., Chicago.
*Archives of Ophthalmology. A. M. A., Chicago.
*Archives of Otolaryngology. A. M. A., Chicago.
*Archives of Pathology. A. M. A., Chicago.
Archives of Physical Therapy. Chicago.
*Archives of Surgery. A. M. A., Chicago.
Archivo Italiano di anatomia e istologia patologica. Bologna.
Archivo Italiano di chirurgia. Bologna.
Archivo Italiano di urologia. Bologna.
Archivio per le scienze mediche. Turin.
Archivos argentinos de pediatria. Buenos Aires.
Archivos de pediatria del Uruguay. Montevideo.
Archivos de la Sociedad de estudios clinicos de la Habana. Havana.
Archivos uruguayos de medicina, cirugia y especialidades. Montevideo.
Arquivos de cirurgia clinica e experimental. São Paulo.
Atti della Società Italiana di ostetricia e ginecologia. Rome.
Australian Journal of Experimental Biology and Medical Science. Adelaide.
Australian and New Zealand Journal of Surgery. Sydney.
Beiträge zur klinischen Chirurgie. Berlin.
Bibliotek for læger. Copenhagen.
Boletin de la Sociedad cubana de pediatria. Havana.
Boletin del Instituto de medicina experimental para cáncer. Buenos Aires.
Brain. London.
Brasil-medico. Rio de Janeiro.

*Cannot be lent.

British Heart Journal. London.
British Journal of Anaesthesia. Manchester.
British Journal of Children's Diseases. London.
British Journal of Dermatology and Syphilis. London.
British Journal of Experimental Pathology. London.
British Journal of Medical Psychology. London.
British Journal of Ophthalmology. London.
British Journal of Radiology. London.
British Journal of Rheumatism. London.
British Journal of Surgery. Bristol.
British Journal of Tuberculosis. London.
British Journal of Urology. London.
British Medical Journal. London.
Bruxelles-médical. Brussels.
Bulletin of the Health Organisation of the League of Nations. Geneva.
Bulletin of the Johns Hopkins Hospital. Baltimore.
Bulletin of the New York Academy of Medicine. New York.
Bulletin de la Société de gynécologie et d'obstétrique. Paris.
Bullettino delle scienze mediche. Bologna.
California and Western Medicine. San Francisco.
Canadian Medical Association Journal. Montreal.
Canadian Public Health Journal. Toronto.
Cardiologia. Basel.
Chinese Medical Journal. Peiping.
Chirurg. Berlin.
Chirurgia degli organi di movimento. Bologna.
Clinical Science. London.
Delaware State Medical Journal. Wilmington.
Deutsches Archiv für klinische Medizin. Berlin.
Deutsche medizinische Wochenschrift. Leipzig.
Deutsche Zeitschrift für Chirurgie. Berlin.
Deutsche Zeitschrift für Nervenheilkunde. Berlin.
Edinburgh Medical Journal.
Endocrinology. Los Angeles.
Endokrinologie. Leipzig.
Folia Haematologica. Leipzig.
Folia medica. Naples.
Fortschritte auf dem Gebiete der Röntgenstrahlen. Leipzig.
Fortschritte der Therapie. Leipzig.
Gastroenterologia. Basel.
Gazzetta degli ospedali e delle cliniche. Milan.
Geburtshilfe und Frauenheilkunde. Leipzig.
Geneeskundig tijdschrift voor Nederlandsch-Indië. Batavia.
Ginecologia. Turin.
Giornale di clinica medica. Parma.
Giornale italiano di dermatologia e sifilologia. Milan.
Giornale medico dell'Alto Adige. Bolzano.
Glasgow Medical Journal.
Gynécologie et obstétrique. Paris.
Helvetica medica acta. Basel.
Illinois Medical Journal. Chicago.
Indian Journal of Medical Research. Calcutta.
Indian Medical Gazette. Calcutta.
International Journal of Psycho-Analysis. London.
Irish Journal of Medical Science. Dublin.
Japanese Journal of Experimental Medicine. Tokyo.
Japanese Journal of Obstetrics and Gynecology. Kyoto.
Journal of Allergy. St. Louis.
Journal of the Arkansas Medical Society. Fort Smith.
Journal of Aviation Medicine. St. Paul.
Journal of Bacteriology. Baltimore.
Journal belge de neurologie et de psychiatrie. Brussels.
Journal belge d'urologie. Brussels.
Journal of Bone and Joint Surgery. Boston.
Journal de chirurgie. Paris.
Journal of Clinical Investigation. New York.
Journal of the Connecticut State Medical Society. Hartford.
Journal of Endocrinology. London.
Journal of Experimental Medicine. New York.
Journal of the Florida Medical Association. Jacksonville.
Journal of Hygiene. London.
Journal of Immunology. Baltimore.
Journal of the Indiana State Medical Association. Indianapolis.
Journal of Industrial Hygiene and Toxicology. Baltimore.
Journal of Infectious Diseases. Chicago.
Journal of Investigative Dermatology. Baltimore.
Journal of the Iowa State Medical Society. Des Moines.
Journal of the Kansas Medical Society. Topeka.

Journal of Laboratory and Clinical Medicine. St. Louis.
Journal-Lancet. Minneapolis.
Journal of Laryngology and Otology. London.
Journal of the Maine Medical Association. Portland.
Journal of the Medical Association of the State of Alabama. Montgomery.
Journal of the Medical Association of Georgia. Atlanta.
Journal of the Medical Society of New Jersey. Trenton.
Journal de médecine de Lyon. Lyons.
Journal of Mental Science. London.
Journal of the Michigan State Medical Society. Lansing.
Journal of the Missouri State Medical Association. St. Louis.
Journal of the Mount Sinai Hospital. New York.
Journal of Nervous and Mental Disease. New York.
Journal of Neurology and Psychiatry. London.
Journal of Neurophysiology. Springfield, Ill.
Journal of Nutrition. Philadelphia.
Journal of Obstetrics and Gynaecology of British Empire. Manchester.
Journal of the Oklahoma State Medical Association. McAlester.
Journal of Pathology and Bacteriology. Edinburgh.
Journal of Pediatrics. St. Louis.
Journal of Pharmacology and Experimental Therapeutics. Baltimore.
Journal of the Philippine Islands Medical Association. Manila.
Journal of Physiology. London.
Journal of the Royal Institute of Public Health and Hygiene. London.
Journal of the South Carolina Medical Association. Greenville.
Journal of the Tennessee State Medical Association. Nashville.
Journal of Thoracic Surgery. St. Louis.
Journal of Tropical Medicine and Hygiene. London.
Journal d'urologie médicale et chirurgicale. Paris.
Journal of Urology. Baltimore.
Kentucky Medical Journal. Bowling Green.
Khirurgiya. Moscow.
Klinicheskaya Meditsina. Moscow.
Klinische Monatsblätter für Augenheilkunde. Stuttgart.
Klinische Wochenschrift. Berlin.
Lancet. London.
Laryngoscope. St. Louis.
Lattante. Parma.
Lyon chirurgical. Paris.
Maandschrift voor kindergeneeskunde. Leyden.
Medical Annals of the District of Columbia. Washington.
Medical Bulletin of the Veterans' Administration. Washington, D. C.
Medical Journal of Australia. Sydney.
Medicine. Baltimore.
Medizinische Klinik. Berlin.
Medizinische Welt. Berlin.
Mental Hygiene. Albany, N. Y.
Military Surgeon. Washington, D. C.
Minnesota Medicine. St. Paul.
Monatsschrift für Geburtshilfe und Gynäkologie. Basel.
Monatsschrift für Kinderheilkunde. Berlin.
Monatsschrift für Psychiatrie und Neurologie. Basel.
Münchener medizinische Wochenschrift. Munich.
Nebraska State Medical Journal. Lincoln.
Nederlandsch tijdschrift voor geneeskunde. Amsterdam.
Nervenarzt. Berlin.
New England Journal of Medicine. Boston.
New Orleans Medical and Surgical Journal.
New York State Journal of Medicine. New York.
New Zealand Medical Journal. Wellington.
Nordisk medicin. Helsingfors.
Northwest Medicine. Seattle.
Novyy khirurgicheskiy arkhiv. Dnepropetrovsk.
Ohio State Medical Journal. Columbus.
Omnia medica. Pisa.
Orvosi hetilap. Budapest.
Pennsylvania Medical Journal. Harrisburg.
Physiological Reviews. Baltimore.
Policlinico (sezione pratica). Rome.
Practitioner. London.
Presse médicale. Paris.
Problemy tuberkuleza. Moscow.
Proceedings of the Royal Society of Medicine. London.
Psychiatric Quarterly. Utica, N. Y.
Psychoanalytic Quarterly. Albany, N. Y.
Public Health Reports. Washington, D. C.
Puerto Rico Journal of Public Health and Tropical Medicine. San Juan.
Quaderni di radiologia. Belluno.
Quarterly Journal of Medicine. Oxford.
Radiologia medica. Milan.
Radiology. Syracuse, N. Y.
Review of Gastroenterology. New York.
Revista argentina de cardiología. Buenos Aires.
Revista de la Asociación médica argentina. Buenos Aires.
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SUBJECT INDEX

This is an index to all the reading matter in THE JOURNAL. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "OS," Organization Section; "SS," Student Section; "ab," abstracts; the star (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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